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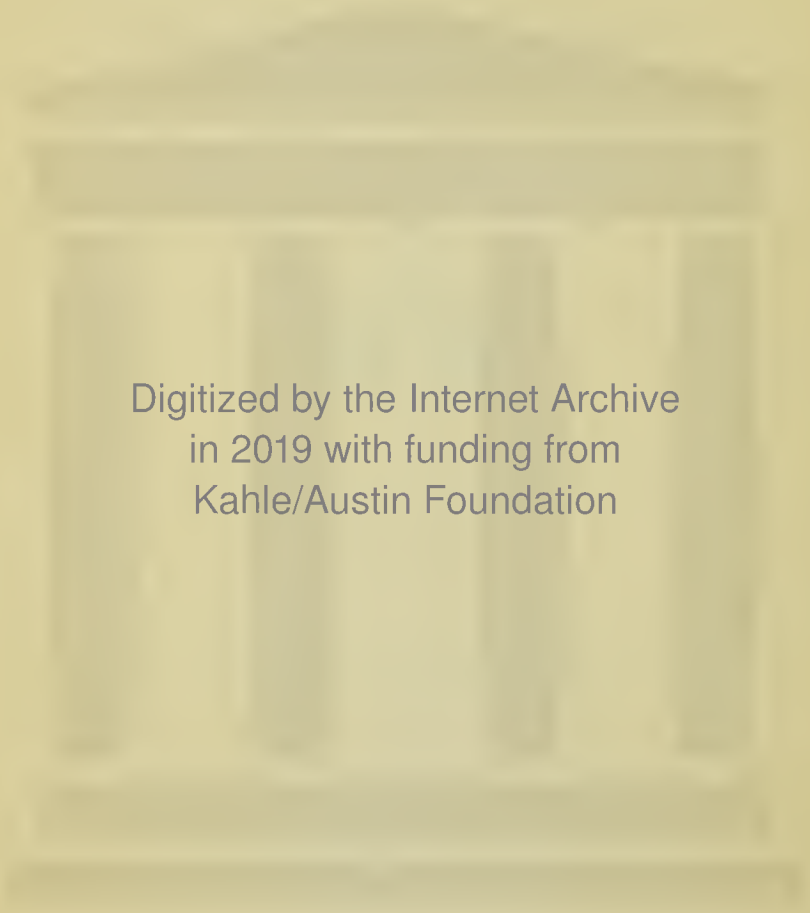

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THE NAVIES OF TODAY AND TOMORROW

A STUDY OF THE NAVAL CRISIS FROM WITHIN

The Navies of Today and Tomorrow

A STUDY OF THE
NAVAL CRISIS FROM WITHIN

By

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AUTHOR'S NOTE

THIS book divulges no technical facts or statistics which are not readily accessible to the publics of all nations in such publications as Brassey's *Naval Annual*, Jane's *Fighting Ships* and the Navy Lists.

The author's deductions from the facts are such as may be drawn, and doubtless have been drawn, by English and foreign naval officers alike. This book contains, therefore, no information that in any respect contravenes the Official Secrets Act.

B. A.

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AN APOLOGY

IN undertaking a book of a critical nature it seems desirable for a comparatively unknown author to preface such a work with some brief account of his qualifications as a critic, and also of his aim, though the value or worthlessness of the criticism should rest on the matter in the book rather than on the prestige of its author.

The Navy, and its efficiency as a national instrument of policy, is of the first concern to every man and woman in this Island Country and in the British Empire, and to such an extent that serious criticism directed against it can only be justified if there is genuine ground for such adverse criticism. If such ground exists, or is believed honestly and disinterestedly to exist, it is manifestly desirable that criticism should find expression. If it is justified it can do nothing but good, and if, on the other hand, it is unsound or frivolous, it must shatter the reputation of the critic while leaving the Navy unscathed.

Some naval officers will stoutly deny that a professional crisis exists outside the head of the author, and these officers may regard this book as mischievous. There are many others, however, who will welcome an examination of present naval policy, provided that such an examination is completely

free of any personal animus against any single officer.

The author bases his qualifications for undertaking such a work on a wide and diverse experience extending over a period of nearly thirty years, and in no way upon any idea, which would be as offensive as it would be manifestly ridiculous, of any exceptional ability of his own as an executive naval officer. The Navy, mercifully for the country, is rich in officers who greatly excel the author in ability, and he would therefore justify his criticisms solely on the ground of general experience and a certain detachment from the snares of extremely specialised thought, a detachment which grows progressively rarer as the world becomes more highly specialised.

Though the greater part of his service has been in command of submarines before, during, and since the war, he has served in battleships and battle-cruisers, in which latter class of ship he was turret-officer and second control officer in the ill-fated *Indefatigable* in pursuit of the *Goeben*, and in the earlier stages of the Dardanelles operations. He was also in charge of the wireless of that ship. He has commanded a destroyer and a small destroyer flotilla engaged upon anti-submarine operations in the post-war years. He was fully and actively engaged during three years of the war in the submarine campaign. Added to this long and varied sea-going experience the author can claim four years' service on the Naval Staff at the Admiralty, in which an intimate acquaintance with matters of policy—strategical, material and

administrative—was naturally acquired. During these four years his work brought him into the closest relations with scientific research.

This experience, therefore, must be his excuse for the present work, coupled with a certain detachment of outlook which he has sedulously cultivated, rightly or wrongly, from boyhood.

The author's aim is an aim that is common to all naval officers—the real good of that great and noble profession of which he has had the honour and happiness to be a humble and undistinguished member for twenty-nine years.

That the argument set forth in this book will be controverted by Lord Fisher's disciples goes without saying. The author can only hope, and believe, that his opponents will recognise the absence of any personal feeling, especially as it is among his opponents chiefly that his later professional life has been cast, and among whom he is happy to count the majority of his personal friends. It is a *system*, and a system only, that is criticised; a system which the Board of Admiralty has inherited, and from which, it can hardly be doubted, they experience many and growing embarrasments.

This book represents the author's contribution, at the early close of his career, to that profession in which he has received nothing but kindness and even-handed justice, and to which he is fortunate in being still bound by the closest tie that is possible.

INTRODUCTION

THE existence of a Naval Crisis from without few will deny. The great silent sea, and the privileges and rights of those who sail it, know it and love it, are now subjects of passionate and often acrimonious debate wherever two or three are gathered together. It sometimes appears that England is in danger of forgetting that the sea is her birthright and that by it she lives. During the past few years the country has been deluged by the impassioned polemics of those who, since the war, have schemed tirelessly to sell their noble birthright of the sea, with much else that is truly and typically English, for a mess of American potage. It is not suggested that these modern Esaus are moved by the sordid motives of their famous ancestor. The honesty of their motives can as willingly be admitted as the fact that they are endangering the integrity and independence of England, and thus the future peace of the world must unhesitatingly be affirmed.

The crisis is not, however, to be attributed by any means exclusively to those who advocate Peace at any Price. There is a more dangerous, because more loyal and moral, body of men and women who have been dragooned into believing that " England is no longer an island." To such folk insistence on sea-supremacy appears, quite rightly and logically, to

provide a recurring source of international friction with no guarantee of the country's future security to leaven it. This attitude of mind is the natural outcome of the carefully fostered belief that our future security lies in the air, or, as it may more aptly be expressed, in the clouds.

But we have yet other bodies of patriotic and loyal men who are insidiously, though unwittingly, undermining the country's trust in her traditional sea-power. Many laymen fully believe that the submarine has so revolutionised modern sea-warfare that the Navy, in its own interests, will be well advised to surrender the immemorial and full rights of blockade enjoyed by all maritime nations in the past, and not only by England. This group of apologists for tampering with sea-power finds a ready and eager army of supporters in those who have lately discovered, again significantly at the bidding of aerial "strategists," that blockade is so diabolically cruel as to render indiscriminate bombing, poisoning, and hooliganism generally, a humane and manly form of warfare by comparison. Whither, it may not unreasonably be asked, has the good sense of these folk departed ? Are we all gradually taking leave of our senses ?

It is, however, no part of our object to examine the Naval Crisis from without. It is from within that it is proposed to study a professional crisis of which the lay public must of necessity be unaware.

The crisis within is for the most part the cause of the crisis without, so that we professional seamen

cannot exonerate ourselves from grave responsibility for those doubts and misgivings which seem to be sapping the country's quiet and steady faith in the future sureness of her naval shield.

The intolerable cost of our shrunken and shrinking modernist Navy, apart from all other questions, acts as a lever for the efforts of those who belittle its future effectiveness in emergency and who would reduce it gradually to a shadow. The world-wide belief in the devastating power of the air receives nourishment in this country, as in America, from extravagant expenditure on the naval Air Arm. The almost universal belief in the extreme potency of the submarine as a commerce destroyer and agency of blockade receives no adequate corrective from naval officers, who alone can supply it. Many grave errors in the late war remain unconfessed publicly, with the perfectly natural result that the country is disposed to question the future value of battleships, and the Navy's capacity to guarantee our food and oil supplies from the depredations of submarines. Thus fear rather than the pure love of peace is the passion which inspires the bulk of the current spate of "peace-talk" that seems to many shrewd and truly peace-loving observers to be scarcely distinguishable from "war-talk."

This criticism of our present Navy, and the defence of traditional sea-power, is divided into three parts.

The first part opens with the advent of Lord Fisher and proceeds to study shortly the revolution in naval doctrine and material that Lord Fisher

wrought. From the feverish preparation for war which accompanied his influence in the pre-war years we pass to a brief study of the war at sea, which, including the Battle of Jutland, was the embodiment of his sea-doctrine and which was waged with ships and material for which Lord Fisher and his disciples were directly and solely responsible.

From the indisputable facts of the war at sea we conclude the first part of the book by a consideration of the perfectly clear lessons which this unsatisfactory naval campaign should have taught us.

The second part of the book opens with a detailed account of post-war naval policy which will reveal, it is hoped conclusively, how seriously, and indeed dangerously, the true lessons of the war have been misapplied. It is shown how post-war policy in material confirms the truth of the earlier analysis of that very modern naval doctrine of sea-power, planted and watered by Lord Fisher, which has now, exactly a quarter of a century from the original sowing, grown into a great deeply rooted tree in the dark shadows of which the Naval Crisis grows and spreads as rankly as a weed.

From a study of material we pass to an examination of our swollen naval staff and the evils of extremely narrow specialism. The training of officers and men is passed shortly under review and organised scientific research is examined. The critical portion of the book concludes with some abstract reflections on the outcome of a clearly defined attitude of mind, and it is shown that the policy and

strategy to be deduced from this mental attitude coincides very closely with the policy and doctrine of which the existing Navy of today is the natural embodiment. That is the argument.

In the third and final part of the book the author sheds the warm cloak of the critic for the shirt-sleeves of the constructor. Starting with the enunciation of what is conceived to be the essence of the true and traditional doctrine of sea-power, we pass to a general consideration of the classes of vessels required to embody the doctrine and strategy which has previously been enunciated. From general classes of ships we turn to the detailed design of what is considered to be an ideal modern battleship, confining the discussion of cruiser design, for the sake of brevity, to correct cruiser characteristics, without repeating all the arguments for each particular feature.

In concluding this chapter the author contrasts such a fleet as is described with the fleet now in being, assuming the total tonnage of the two fleets to be equal, and naval officers are invited to decide in which of the two fleets, if opposed in war, they would prefer to serve as professional men, and regardless of nationality.

From the ships of the New Navy we pass to the question of blockade, and the future of the naval Air Arm is discussed. Certain proposals for the future training of officers and men, and for the organisation of a reduced naval staff, are adumbrated, and the book concludes with some reflections on the ethics of war and the merciful nature of sea-power.

It is the author's earnest hope that his book may at least contain good seed, and that it may contribute something, if only a little, towards mitigating the risk of a grave prolongation of our recent maritime apostacy.

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" This England never did, nor never shall,
Lie at the proud foot of a conqueror,
But when it first did help to wound itself."

PART I

THE PRICE OF LORD FISHER

CHAPTER I

THE ADVENT OF LORD FISHER

ON October 21st, 1904, a new star came to rest over the Admiralty Building, and for better or worse Lord Fisher became the supreme architect of our naval destiny for the generation that included the Great War. Great were the advantages anticipated by the Public under the guidance of this powerful and ruthless administrator. The term "administrator" is used advisedly, for it was as such, rather than as a great sea commander, that Lord Fisher's reputation flourished. The public expectation of drastic changes was shared to the full by the Navy, but with this marked distinction: Whereas the country and its government were for the most part united as to the wisdom of the forthcoming changes, naval officers were deeply, indeed passionately, divided. The clamour for evolution in the Navy, from without as well as from within, was but the reflection of the changing philosophy of the country, if not of Western civilisation as a whole. The approaching clash of two embattled philosophies, the evolutionary and the classical or traditional, was, in the Navy, galvanised into life and activity by the famous quarrel between Admiral Lord Charles Beresford and Admiral Sir Percy Scott, who, as Lord Charles' junior officer, defied his

senior in his notorious and undoubtedly mutinous signal to his squadron on July 7th, 1908, that bright-work was seemingly of more importance than efficiency. The quarrel, though at first sight trifling and personal, was in reality no such thing. To the Public it was the first visible spark from the clash of warring ideas already at grips and soon to come to settlement for a generation.

Popular opinion not unnaturally ranged itself on the side of the young, energetic and enthusiastic admiral who ostensibly nailed the flag of efficiency and progress to his mast as the emblem of his school of thought. " Bright-work," " spit and polish," and lazy traditionalism were assumed to be emblazoned on the ensign under which the honest and capable but out-of-date seamen of the Blue Water School elected to sail.

Now that these distinguished and intensely sincere men, Lord Charles Beresford, Sir Percy Scott, and Lord Fisher, have passed to a less troubled and, let us hope, less perplexing world, it is possible to discuss those matters which so deeply stirred them, and through them the Navy and the country as a whole, with calmness, and with a total absence of heat or personal partisanship.

Few naval officers will deny, and certainly not the author, that there were some grounds for criticism of the Navy in the early years of the century. Years of peace and unquestioned sea-supremacy, combined with a prestige never surpassed or since attained, had bred to some extent the yachting spirit

in the Royal Navy, no bad spirit, as some will think, in times of profound peace. Seamanship was of a high standard, and tactical genius in the handling of fleets was richly represented. We had a flag list including such men as Wilson, Noel, Custance, Domvile, Fremantle, Callaghan, Henderson and others, all self-reliant and unbending individualists, and all, therefore, possessors of those astonishing nicknames now almost extinct in our superficially adventurous generation. All these great names were seamen to the marrow, inheritors and exponents of the Nelson tradition. Some are still with us and, in their old age, their strategical knowledge is freely at the disposal of an affectionate if unappreciative country. They were all of the school of traditional naval thought, and it is possible, though by no means certain, that sound strategical thought, and tactical skill, were insufficiently leavened with anxious forethought about *material* and the use of weapons, a fault, if it in fact existed, easily attributable to that atmosphere of unquestioned command of the seas which had prevailed throughout the last century, and therefore throughout their professional careers.

However this may be, a cloud no bigger than a man's hand was seen to be arising over the horizon of the North Sea, a little cloud that it was foreseen might grow into a thunder-cloud. The time was ripe for unostentatiously burnishing that mighty weapon upon which England must for all time rely if she is to retain her authoritative position in the councils

of the world as an upholder of what she conceives to be truth, freedom and justice, and if she is to continue to be the principal obstacle to European tyrannies, a position which, with all her lapses, she has honourably and chivalrously maintained for centuries.

To the traditional school of sailors it was plain, or could have been made plain, that the Navy must quietly rouse itself from its easy-going ways, especially in gunnery. These men believed that the foundations of our sea supremacy were essentially sound, based as they were upon seamanship and a great fighting doctrine. They had reason to be satisfied, on the whole, with their material, for we possessed a great fleet of battleships and cruisers which were, for the most part, unrivalled in design and sound construction. In numbers and tonnage we had an overwhelming preponderance. It was in the use and control of its guns that the fleet was perhaps deficient and in which awakening was overdue. Even so, it must be emphasised that our gunnery was at this time by no means inferior to that of other nations, as unfortunately it subsequently became.

The young and enthusiastic Material School, on the other hand, with Sir Percy Scott as the harbinger and Lord Fisher as the herald, proclaimed our Navy and its doctrines to be remnants of a prehistoric age, unfit for reform but ripe for evolution. The great fleet was pronounced to be a conglomeration of arks and a large proportion of its senior officers to be nearly related to Noah—admittedly great seamen

and tacticians, but lacking in material *vision*. The spirit of "scrap the lot" had, for good or evil, entered into the Navy, and that spirit triumphed, finding its embodiment and executor in the great and fascinating personality of Lord Fisher who, at the behest of the Government and nation, had become judge, jury and executor of his own policy.

It is not the author's intention to reopen, or to lay bare, the personal wounds that the great split in naval opinion occasioned. Those wounds have doubtless long since been forgiven by the surviving victims of the Fisher policy. Many of them are buried and forgotten by the world. Indeed, he is in any case too young to know of them except by hearsay, being in fact only a midshipman when these stirring events were taking place. All that need be said is that half-pay and retirement claimed the larger proportion of those who had pleaded for *reform*, while promotion and honour very naturally descended, like manna from heaven, upon those who had unequivocably supported the winning policy of evolution.

The name of Lord Fisher is still a name with which to conjure. Since Nelson no seaman's name has so branded itself upon the consciousness of the nation and the Navy. He was indeed the founder of modern foreign navies and of modernist doctrines of sea-power. Here was a man who combined in his extraordinary personality enthusiasm, ruthless force of character, a genuine, if curious, form of piety, and intense sincerity. His administrative and organising

genius had thus the force of an explosion behind it. The underlying soundness of his naval doctrine and strategical conceptions could not truly be judged by the lay public, especially when his own case was pleaded by such a man. Before his fiery onslaught less spectacular, though possibly more far-seeing seamen went down like ripe corn before his ruthless scythe. When on January 25th, 1910, Lord Fisher left the Admiralty to give place to Sir Arthur Wilson, his policy was irrevocable. Indeed, Lord Fisher has frankly told us in his Memoirs how that Sir A. K. Wilson was First Sea Lord in name only. He openly tells us of his secret scheming with Mr. Winston Churchill, and on June 25th, 1911, he wrote to Lord Esher from Bad Nauheim : " I need not say that I remain in the closest bonds with the Admiralty. I never did a wiser thing than coming abroad and remaining abroad *and working like a mole*."

It is not intended to examine in any detail, at this stage, the innovations which Lord Fisher set himself so thoroughly to accomplish. Subsequent chapters will, it is hoped, reveal the nature of the Navy and the war that these changes fathered. It may be wise, however, to refer without comment to the more noteworthy features of Lord Fisher's policy. In 1906 the anxiety, vague and shadowy, of the growing ambitions of Germany had been crystallised into acute naval rivalry and clamorous mistrust, by the redistribution of the fleets in home waters and particularly in the North Sea. This policy of challenging concentration may or may not have been

wise. It is at least arguable that the outbreak of war is unlikely to be so sudden as to preclude the necessary concentration of naval power, in these days of steam, when the crisis is imminent, thus avoiding that feverish suspicion in which bellicose intentions ripen like tomatoes in a hot-house. However this may be, the policy of extreme concentration drained the outlying stations of the world of their cruisers, and the China station of her six battleships, while its effect on Germany was instantaneous. The great race in naval armaments was joined, a race which received an impetus that can hardly be exaggerated by the bombshell of the " Dreadnought " policy.

True to his creed of thoroughness and ruthlessness, Lord Fisher had looked round upon our great fleets of battleships and cruisers and he had conceived them to be old-fashioned, out-of-date and therefore worthless. That the fleet was *relatively* overwhelming weighed not a feather in the balance. It has been said, perhaps truthfully, though there are good reasons for doubting it, that had we not initiated the new ships Germany or another nation—Italy—would have done so. England, since the introduction of steam, has set the standard of fighting vessels, but it is possible that history in this instance would have provided an exception. We cannot say. However this may be, the " Dreadnought " revolution was ushered in with clamorous applause by the Navy, cleansed with the Fisher purge, and by the country as a whole. Is it not likely, indeed certain, that this applause found an echo almost Homeric in Teutonic

lands? In one dramatic stroke our splendid fleet was consigned to the scrap-heap, and Germany entered the great armament race without that handicap which, previously to the *Dreadnought*, had been overwhelming if not absolute.

The materially "Dreadnought" mind of Lord Fisher was permeating the Navy as a whole. Indeed, serious opposition to his policy, and his conception of naval efficiency, had been removed by the simple expedient of removing the bulk of those senior officers who mistrusted, and selflessly opposed, the new orientation of naval doctrine. Great changes in the training and employment of naval officers were undertaken. Specialisation became intense; material specialists came to the fore and what are known as "salt-horse" officers—that is to say, general service and exclusively sea-going officers—drifted progressively into obscurity. The tendency to regard material as the principal avenue to promotion gave rise to an atmosphere in which the Torpedo branch expanded from comparative obscurity into the position it now holds of what is practically an engineering profession. The entry and training of cadets was revolutionised. It is true that the new system of obtaining and training cadets could have had little, if any, influence on the conduct of the war. It is only now, a generation after its initiation, that the full effects of excessive technical and mathematical training in youth are ponderable.

On the then existing body of naval officers, however, Lord Fisher's beliefs worked like leaven on a

loaf of bread. Had not this remarkable man proclaimed, and set forth in writing, that the naval officer of the future should be an *engineer*? Was it not natural that those with a taste for engineering, rather than seamanship, should find especial favour, and thus promotion and positions of power whether at sea, in the growing shore establishments, or at the Admiralty? Under the enthusiastic and able direction of the new brooms, of necessity more concerned with innovation and the initiation and production of new material than with its tactical employment at sea, a vast new Navy was rapidly taking shape, followed, countered and recountered at each successive point by our prospective opponents, to whom Lord Fisher had given the incalculable advantage of a clean start in material by the initial "Dreadnought" policy. Fortunate indeed was it for us that our opponents inherited Lord Fisher's strategical doctrines as well as his material policy.

In the midst of this feverish competition in material it is not surprising that naval doctrine, inherited from the past generations, underwent gradually, but effectually, a subtle change. Lack of trial and experience with the new ships and weapons gave rise to a belief, not infrequently stated in plain terms, that it was impossible to foresee what would happen when these mighty engines of war met their German counterparts. Few trials were undertaken to test with what accuracy these vast projectiles could be launched against a swiftly moving target. It was assumed that the accuracy of fire and the penetra-

tive capacity of our shells would be all right on the day, though *gun-control* under active conditions had in no way kept step with the range and power of the gun itself. Men had already begun to regard themselves as the servants of material rather than as its inflexible masters, an attitude of mind which tended towards a belief that security was mainly to be sought in building, and in the event of war maintaining, a fleet immeasurably more powerful in material of all sorts than the fleet of our opponents. Thus insidiously a revolutionary and fallacious doctrine of sea warfare arose. A fleet in Being, a fleet of great material superiority, was to be regarded as an acceptable substitute for a decisive victory at sea, a doctrine which looked to a Jutland rather than a Trafalgar for the maintenance of our sea supremacy, and thus the defence of our trade. In homely language, "safety first" became, perhaps for the first time in England's maritime history, a naval doctrine of war.

It has been truly said by Manning in his "Life of Sir William White": "Perhaps the dominant feature in Sir John Fisher's character was the love of innovation for its own sake."

Innovation being of the very essence of Lord Fisher's mentality, it is not surprising that he should have sought, and when found, welcomed, a means of superseding coal as the motive power, and therefore the life-blood, of the Navy. It was owing to Lord Fisher that oil, over which we exercise no *strategical* control, has now ousted coal from the Navy, and

it is on record that as long ago as November 22nd, 1911, he wrote to Sir Marcus Samuel: "What I am driving at is oil alone for fuel and the introduction of the internal combustion propulsion." Indeed, the plot, for such it was, by which Lord Fisher and Mr. Churchill saddled the Navy with a foreign fuel is one of the most extraordinary episodes of these feverish and evolutionary years. The Royal Commission on Oil, which assembled on September 24th, 1912, was a packed Commission, and the decision of Lord Fisher and his dupe, Mr. Churchill, to substitute oil for coal had been reached in advance of the assembling of this muzzled body. On September 14th, 1912, Lord Fisher wrote: "This Royal Commission (on oil) is a wonder! We have our great meeting on September 24th, and practically it is finished, though it will go on for years and years and never submit a report! You will love the *modus operandi* when some day I expound it to you!!" Lord Fisher had written: "I've got enthusiastic colleagues on the oil business! They're all bitten! Internal combustion engine rabies!" And this is the judicially minded man that Mr. Churchill engineered into the chairmanship of the Royal Commission on the Navy's life-blood. Mercifully, as all will allow, his plans had not the time in which to mature before the storm broke, though now they have come to full fruition.

There is no need to pursue in detail the outstanding features of "Fisherism." They are all well known, firmly established, and generally ap-

proved both ashore and afloat, though there are more than a few signs among naval officers on the active list that a note of interrogation has raised its inconvenient head at sea. Though the author's intention in succeeding chapters is rather to bury than to praise Lord Fisher, he is not so foolish as to underestimate, or so mean-spirited as not to admire, the towering personality of this evolutionary naval administrator. "Jacky" Fisher cannot be said to have departed this life, like lesser men, for his spirit permeates and dominates the Navy today, and a very zealous and devoted spirit it is that still goes innovating, rather than steaming, on !

Three men, perhaps above all others, have left their mark on the spirit of English life in the generation that is past—Darwin, Wells and Fisher. To Darwin must be conceded the position of the new Allah ; Wells can with justice claim to be the new Allah's most puissant prophet ; but to Fisher fell the rôle of the master executant of the new philosophy. Indeed, it is difficult to resist the conviction when reflecting on Lord Fisher's words and deeds, and on modern war material, that no word of Mr. H. G. Wells escaped the eager eye and attentive ear of the great First Sea Lord. Lord Fisher's passion for airships, among many other fantasies, was undoubtedly excited by Mr. H. G. Wells' popular extravaganza, "The War in the Air," every anticipation of which has been falsified, including his vision of the monorail. He had, in truth, begun to substitute air-sense for sea-sense. "Soon after I became First Sea Lord

on October 21st, 1914," he writes in his Memories, "I had called together at the Admiralty a Great Company of all interested in the air; . . . In three weeks an airship was flying over the Admiralty at fifty miles an hour (there's nothing you can't have if you want it enough), and now we've reached the Epoch—prodigious in its advent—when positively the Air commands and dominates both Land and Sea; and we shall witness quite shortly a combination in one structure of the Aeroplane, the Airship, the parachute, the common balloon, and an Aerial Torpedo, which will both astound people by its simplicity and by its extraordinary possibilities, both in war and commerce. . . . The aeroplane has now to keep moving to live—but why should it? The aerial gyroscopic locomotive torpedo suspended by a parachute has a tremendous significance," etc., etc.

We must pass, however, from a consideration of the man himself to a study of that mighty but vulnerable instrument of policy—the Navy—with which we opposed the formidable German Navy and which, by common consent, is still the material embodiment of Lord Fisher's great unbalanced spirit.

CHAPTER II

THE WAR AT SEA

ON August 4th, 1914, with the last stroke of Big Ben, England was at war. The weapon evolved by Lord Fisher was to be tested. Though not a man had as yet met a violent death, the moment was heavy with awful foreboding to the few who could foresee, if only dimly, the sickening carnage that lay ahead. To the *multitude*, but not to Lord Grey, Lord Oxford, and the statesmen of all parties, as is now too frequently asserted, the outbreak of war was an exhilarating, if not a definitely pleasurable, adventure. We have accustomed ourselves to speak of the late war as the greatest war in history. "Greatest" it assuredly was if we gauge greatness by the waste of humanity and material involved: the carnage still induces a feeling of physical nausea in those few whose imaginations can conjure up a picture of 10,000 corpses in close formation. Multiply such a charnel a thousandfold and, mercifully, the most imaginative man is left without a picture on his mind of such a ghastly spectacle. When, however, we use the term "the greatest war," we need surely to be exactly clear as to what we mean. The issue involved was as great, though not greater, than was the issue raised by Napoleon, the present tendency to belittle the issue notwith-

standing. Indeed, it was singularly alike, though England's strategical plan in dealing with the situation was very different. Whereas we resisted Napoleon's pretensions to the tyranny of Europe, and finally broke his power, by the protracted pressure of sea-power over a long period, a pressure *punctuated* only by military expeditions at weak spots in Napoleon's European defences; against Germany, on the other hand, we invaded the continent permanently on a vast and unprecedented scale, thus extending immeasurably our own vulnerability with the awful consequence that we invited, and thereby leading directly to the most terrible and bloody massacre the world has ever seen.

It is universally assumed that the repudiation of our traditional island strategy in the late war was inevitable. This may be true, though why is not altogether clear. To the author's mind it seems evident that the *temporary* occupation of France, Belgium and other countries by Germany would have been a thousand times preferable to the ruin that actually overtook Europe. Such occupation would have been, it is true, a cruel blow to the national pride of these great and brave countries, but it would have involved the cessation of slaughter and ruin of themselves as well as of our political though not personal enemies. Relief would have come to the occupied lands, as of old, by the steady and comparatively bloodless pressure of England's sea-power, and by limited but *strategically* powerful military expeditions, if, that is to say, England's

sea-power had undergone no inherent deterioration in its potency. The occupation of the Channel ports would, it is true, have accentuated our maritime anxieties, but such occupation would have laid upon the broad backs of British seamen responsibilities no greater than those cheerfully and triumphantly surmounted by our forefathers in the Golden Age of English sea-power at grips with the great master mariners of France.

However this may be, few soldiers or sailors, or for that matter civilians, will maintain that the late war was the greatest in history in the sense that it formed a setting for a display of military genius. Indeed, with the possible exception of Lord Allenby's campaign against Turkey, the war on land and sea was essentially a riot of material and masses rather than a series of battles between strategical and tactical masters who employed men and machines as pieces in a contest of mind. Men and material were openly regarded, and spoken of, as fuel—just that—in an uncontrolled furnace, rather than as individuals and weapons in a game, if a deadly one, of giants. We look in vain for a Sedan or Waterloo, for a Nile or Trafalgar. Heroism, and an almost superhuman patience, culminating in fatalism on the part of millions of humble officers and men, were the characteristics that redeemed this chaos of massed humanity and matter, a species of mass production of war, from a drab, uninspired, and barbaric slaughter. The war ashore was, for the most part, a vast and bloody Balaclava,

the by-word of heroism implementing unsound tactics.

It is no part of the author's intention to review the war as a whole. War books, official and otherwise, are as numerous as are the autobiographies and apologies of its leaders, if in truth any man can claim to have "led" a war in which material had assumed command and in which butchery was merely organised. It is desired rather to subject to a very brief examination what appear to be the three outstanding features of the campaign at sea. We may pass over, without comment, such famous events as the escape of the *Goeben* from action with the Mediterranean Fleet—the absence from the Far East of vessels competent to deal with the *Scharnhörst* and *Gneisenau*—the glorious disaster of Coronel—the victory, the only sea victory of the war, of the Falkland Islands brought about by a sound disposition of force—long overdue—and a combination of great good luck and overwhelming material superiority—the failure of the Dogger Bank, in which action the British battle-cruisers were superior in *speed* and weight of material—the epic attack on Zeebrugge on St. George's Day, an action planned and executed in the very spirit of the Nelson tradition.

All these events, with the exception of Zeebrugge, seem to provide grounds for reflecting on the outcome of the new doctrine which had grown up under Lord Fisher's inspiration in the years preceding the war.

The three events, towering above all others, to which it is desired, however, to draw more detailed attention are:

1. The total disappearance at sea of the German merchant marine.
2. The Battle of Jutland.
3. The German submarine campaign.

The expulsion from the sea of every German merchant vessel for four years provides, perhaps, the most striking demonstration of sea-power that has ever been presented to the world. In the old days of sail the merchant vessels of the weaker power continued, though to a seriously reduced extent, to carry goods for the sustenance of their country. With the introduction of steam, however, the stranglehold of the stronger sea-power was rendered dramatic in its completeness. Had England enforced complete blockade from the first, as did America in the Civil War, and had she insisted from the outset on the right of search and on her traditional enforcement of maritime belligerent rights against all trade destined for the sustenance of the enemy, it will hardly be denied that the effect on Germany, dependent on the outside world for the means of waging a protracted war of material, would have been overwhelming. Is it not possible that Germany, and America herself, now bitterly regret that we did not fearlessly enforce a bloodless blockade that would have saved their sons, as well as our own and those of our other Allies, from the wholesale massacre that the unceasing supply of material not only made

possible but insured? The final peace treaty would have been shorn of its blood lust; the terms could not have been harsher, and would doubtless have been more statesmanlike than in fact they were.

Co-existent with this stranglehold on German commerce which, pending a decisive sea action, our material superiority at sea insured, there was the perplexing phenomenon of the growing vulnerability of our own trade. The position was this: The German Merchant Marine was dead through the agency of surface ships reinforcing Germany's naturally weak strategical position in the outside world. Ours was latterly in danger of ceasing through the activities of submarines, the outstanding feature of which vessels is their ability to range the seas, *though not necessarily to any valuable purpose*, when the enemy's surface fleet is greatly superior. It thus seemed that sea-power was likely to end in stalemate with the sea denied to all commerce of all countries. It is this extraordinary position of affairs which seems, in these post-war years, to have led patriotic Englishmen to question not only the rights of blockade but the value of it. Because England is an island, we read and hear on all sides plausible arguments for abandoning blockade in our own interests, while the value of battle fleets is seriously questioned in view of the failure to achieve victory at Jutland and the disaster we so narrowly escaped at the hands of German submarines. It is this growing attitude of mind which makes it so very urgent to examine, without mincing words, the two principal events of

the war which led to that state of affairs which seems to have shaken the traditional confidence of the country in the reliability of the Navy as its one sure and *humane* shield in the day of battle.

The two outstanding events are the Battle of Jutland and the subsequent submarine campaign, the latter being the direct outcome of what naval officers, with few exceptions, regard as the tragedy of Jutland. The facts of Jutland are well known and undisputed, and, however humiliating the confession may be, the following salient points are generally admitted. The great superiority of our fleet in sheer weight and numbers: the failure during daylight to close the enemy to an effective range, coupled with inelasticity in the *new* signal books, which rendered the proper tactical deployment difficult: the confusion with wireless and the general weakness in the signalling organisation: the dominating position of the British Fleet, between the Germans and their ports, after nightfall: the unchallenged passage and escape of the German Fleet astern, and in view of, the British Fleet, which held its steady course south without alteration until the German Fleet was beyond reach of engagement: the total failure of the German submarines and our own to get into touch with the opposing fleets: the complete failure of the German airship reconnaissance: the dauntless battle-cruiser action in which the ships, upon which the thoughts and energies of executive officers at the Admiralty had been riveted in the pre-war years, went down like cockle shells before the German gun-

fire from guns, for the most part, of *lighter calibre* than our own: the superiority of the German gunnery, *and its control*, over the gunnery of our fleet: the superiority of the German tactics.

These facts about Jutland cannot be burked, no matter how skilful or persistent the apologetics. In the controversies over Jutland, however, one ugly and stultifying feature has always been in evidence. The controversy has assumed a bitter and *personal* form, the champions ranging themselves into almost savagely opposed camps. The author can say with all sincerity that he is without personal bias of any kind. The flag-officers involved were in all cases brave, skilful, and single-minded in their determination to extract what they conceived to be the utmost advantage from the situation, as were the great German sailors who opposed us. Jutland was the climax to which ten years of Lord Fisher's doctrines inevitably tended. Jutland was the fruit that had ripened on the philosophical tree whose roots were planted in the doctrine that the maintenance in being of a materially superior fleet might be made the equivalent of a decisive sea victory with all the risks and uncertainties that a decisive action, with untried modern material, might involve. If any readers are disposed to question that such a doctrine has arisen, and indeed still persists, they are very respectfully asked to consider how the defence of the Battle of Jutland has universally been based upon the assumption that we obtained the *fruits* of victory, without victory, by the retirement of the High Sea

Fleet to its harbours where it remained, except for a sortie on August 19th, until its surrender as a condition of peace on the breakdown of the German campaign *ashore*. Indeed, Admiral Harper, perhaps the clearest and ablest apologist of the war in general, and of Jutland in particular, has expressly stated that we obtained the fruits of victory as surely as if we had destroyed or utterly incapacitated the German Fleet.

While the *indirect* fruit of Jutland was the temporary shaking of public confidence in the invincibility of the Navy, and the emergence of a doubt, now gathering momentum, as to the value of battle fleets, the *direct* result was the intensified German submarine campaign. From the nature of things we were unable to know what the future intentions of the German Fleet might be, and we were thus compelled to maintain, and we did in fact immensely strengthen, our battle fleet and all its vast subsidiary fleets of cruisers, destroyers and submarines for that future sea battle which was always, so far as we could judge, pending. The Germans were thus the strategical masters of the situation at sea. Under cover of that threat of battle with which they immobilised, and forced us to keep concentrated, our gargantuan and ever-growing armada, they launched the submarine in hordes against our trade. Their knowledge, and our ignorance, of their intentions as to the future employment of their fleet enabled them to release personnel and to turn their great shipbuilding resources to the wholesale construction of

submarines. As the months rolled by the seas round Britain became infested with these craft. No serious risks could be taken with the Grand Fleet and its auxiliaries, for it must remain concentrated and ready at a moment's notice in face of the ever-present threat of the powerful and, after Jutland, highly respected fleet at Wilhelmshaven. Thus, until the glorious attack on Zeebrugge with a *scratch* fleet, no attempt was made to blockade the ports into and out of which the dreaded submarines were pouring. The submarine needles were hunted instead in oceanic haystacks. Here was presented to us the first-fruits of unsound strategical doctrine. The vastly superior British Fleet was certainly "*in Being*," but unfortunately it had been immobilised by a greatly inferior fleet also "*in Being*."

In passing from this aspect of the disaster of Jutland we come to a consideration of the anti-submarine campaign which Jutland imposed upon us, and here we are presented with perhaps an even more striking example of the relative futility of massed material and effort when employed to give effect to unsound strategical and tactical plans. In 1917 Lord Fisher, the *Deus ex machina* of the materialists, had been recalled to the Admiralty, from which he had resigned as First Sea Lord in May, 1915, and as the creator of that material colossus now ignominiously tied to Scapa Flow he was commissioned to organise the scientists to combat that threat of total defeat by submarines to which his strategical doctrines had now exposed the country.

Armies of specialists and scientists were drafted to the Admiralty, and an inflated anti-submarine staff of naval officers and professors was created to deal with the new and formidable menace.

The schemes set on foot were exactly what might be expected from men of the extreme material school, men who thought always and persistently, like their exemplar Lord Fisher himself, in terms of machines, devices, and dodges, rather than in terms of simple, straightforward and therefore inexpensive strategy. Scores of freak ships were constructed: 7,500 trawlers were deflected from their proper duties of feeding the nation to carry and tow those fraudulent hydrophones which were responsible for not one single destruction of a submarine. It is with a feeling of shame that a reference is made to that corps of sea-lions, which was organised and *trained* by scientists with the assistance of naval officers, and in conjunction with submarines and destroyers. Loops, barrages across the North Sea, vast mine-fields, nets and countless scientific projects were launched. Submarines were constructed in scores to search the oceans and seas. While this prodigious effort and outlay was maturing, and finally in full blast, *convoy was steadily resisted by the organised naval staff*, their argument being that it would be inviting disaster to concentrate our merchant vessels in groups—to put many eggs in one basket—and the naval staff won the day in opposition to individuals, naval and civil, who urged the institution of convoy at the outset of wholesale sinking.

It is, of course, true that large numbers of German submarines were destroyed, but in spite of the casualties which so great a material effort could hardly fail to effect, the curve of sinkings steadily rose, the number of German submarines increased, and in April, 1917, we were faced with imminent disaster. Eight hundred and seventy thousand tons of shipping were sunk in that one month alone, and replacement began to lag behind destruction. It is on record that the American Naval Staff had been informed that, failing some dramatic salvation, our defeat at sea, total and overwhelming, was a matter of weeks, such defeat involving, it need hardly be said, the collapse of the campaign ashore.

During the last few minutes of the eleventh hour the institution of convoy was forced upon a reluctant staff. The expression " forced " is used advisedly, for again the truth of the statement is on record. It is easy to be wise after the event, and the author has no desire to regard himself as wiser than were his senior officers at that terrible time. Surely, however, it is wise to be wise after the event. The Navy had history and tradition to guide it, reinforced by the shining example of the Channel convoys and the French coal trade. Almost complete immunity from casualties had been the lot of this vital traffic. To claim, as is sometimes claimed, that the doubts of merchant shippers and captains as to the feasibility of the group sailing of merchant vessels, both from the seamanship and commercial aspects, were an obstacle to the institution of convoy is to admit that

the Admiralty had not a mind of its own or, if it had, that it was weak where it should have been strong. As a matter of fact the argument is a retrospective one, put forward in self-defence, for, as has been emphasised, the naval staff pronounced convoy to be disastrous on tactical and strategical grounds, so that any hesitation on the part of the merchant service to group their sailings merely confirmed the naval staff in their strategical blunder. It in no way originated it.

Those who may be interested in the statistics of the submarine attack on trade will find food for reflection in "Sea-borne Trade," by Mr. Fayle. The statistics of losses, and the instantaneous effect of convoy, wherever instituted, will prove illuminating indeed. Suffice it here to say that out of 98,000 sailings in convoy, or groups without escorts on the high seas, 430 vessels only were sunk or damaged (a very different thing), or rather less than one-half per cent., a loss which, though irritating, was in no way serious when we consider our great shipbuilding resources. Such a loss was, in fact, considerably less than the percentage of losses experienced *after* the Battle of Trafalgar. It must be emphasised, furthermore, that the rate of destruction of German submarines rose rapidly with the introduction of convoy and for a simple reason. Unable to locate the concentrated groups of vessels on the high seas, German submarines were forced into the approaches, at which points a relatively trifling force of small surface craft were able to achieve by concentration

what the most prodigal outpouring of effort, in personnel and material, had been unable to accomplish before convoy and group sailing were instituted.

It has been urged by post-war apologists, as it was said at the time, that convoy could not, in any case, have been instituted earlier for lack of destroyers and small cruisers to act as escorts. As events proved, it was the *strategical* and *tactical* defence supplied by *grouping*, rather than the *physical* defence of the escorts, which provided immunity from attack. If naval officers are disposed to controvert this view, they are immediately on the horns of a dilemma, and the conclusion is the more disquieting, for it reveals that it was the German Fleet, still intact and threatening in its harbours, that precluded the detachment of those fleets of destroyers, cruisers and auxiliaries for the protection of the convoys. How, in the face of these indisputable facts, can Jutland be regarded as anything short of a disaster, and the subsequent handling of its natural child, the submarine campaign, a tragedy, saved, but only just saved, from a catastrophe ?

Few naval officers will deny that the two events in the war that have been discussed in some detail constitute the outstanding features of the naval campaign. Do they not both reveal in a strong light the pre-eminence of sound strategical doctrine, implemented, of course, with *adequate* and sound material, and demonstrate the relative futility of material, often faulty, though employed on a scale which wellnigh beggars description, when used to

implement a strategy that is inherently unsound? Wherever organised and concerted action, which depends upon doctrine, was called into play, there we can see the logical working out of the philosophy that guided the Navy from the day on which Lord Fisher's star came to rest over the Admiralty; they were Lord Fisher's ships at Jutland, and his projects for the most part in the submarine campaign, which clothed Lord Fisher's philosophy of war. Those who look back on the war with satisfaction, and they alone, can view without anxiety the naval doctrines which he bred in the fleet and which live and flourish to this day.

It is noteworthy that the scores, indeed hundreds, of brilliant episodes which illuminated this drab and materialistic war were in all cases *individual* exploits between single or detached ships; exploits in which individuals, without thought or introspection, gave expression to that traditional doctrine which set the man far above the machine; that doctrine, native to all English sailors, which bids them engage the enemy more closely and, after all risks have been reasonably allowed for, at all costs.

CHAPTER III

THE TRUE LESSONS OF THE WAR

IN the last chapter the author drew attention to the outstanding features of the war at sea which can hardly be flattering to the pride of the Navy and of the country, to whom the prestige of the Navy is of the first concern. His analysis is founded upon no foolish or impertinent view of his own superior wisdom. He, like a great and growing body of naval officers now serving, is wise, if he and they are indeed wise, after the event. We may all of us, however, obtain consolation from the reflection that the false doctrines, if they were false, which marred the conduct of the war at sea, were in no way confined to this country. They were common to our Allies as well, mercifully, as to our late enemies who inherited them, as the German naval staff has recently told us, in 1907. Neither were they peculiar to the war at sea, being all too glaringly displayed in the campaign on land which was permeated with the philosophy for which Lord Fisher stood and still stands. Navies, and particularly the British Navy, are however singularly perfect mirrors of the spirit and mind of the nation at large, concentrating and focussing as they do into a compact and calculable whole those tendencies and their effects which, in the wide world of politics and industry, may appear

to be casual and disconnected. Any man, therefore, who may be disposed to agree with the author's criticisms of the Navy will assuredly remember that the nation always gets a navy which is a mirror of itself. All of us have been living in glasshouses for the past generation; glasshouses in which such exotic plants as materialism, extreme specialism, belief in mass production and mass action, mistrust of individuality, and reliance on committees and bureaucracy have flourished like orchids, and in which the temperate and therefore native plants of individualism, moderation, and belief in the absolute control of mind over matter, have wilted but not, fortunately, died. There are, indeed, many signs and portents that the traditional English virtues are about to reassert themselves.

The late war was in the nature of an adventure into the physically unknown. Men were prone to cower in uncertainty, the parent of timidity, before the material Colossus they had themselves erected. No one, it was believed, could foresee the effect of the new weapons. Thus the element of chance was believed to enter so potently into a great sea battle that decisive action was postponed to what was hoped would be a more propitious occasion on which past experience could be brought to bear, an occasion which in fact never again presented itself. This view is no mere opinion, for was it not said at the time, and has it not since been reiterated, that the issue was so grave that extreme caution at Jutland was incumbent upon those in whose hands lay

the destiny of England and therefore of the world? "Safety first" had in fact become a naval doctrine both to the Germans and ourselves, as it was recently the advertised battle-cry of a great political party. That the safety of the country is the first concern of the Navy and the Government is a truism, but is not safety in times of crisis and danger achieved by bold measures, and are not the very dangers we dread courted by timidity, inaction, or half-measures?

By the mercy of God none of our mistakes worked themselves out to a catastrophic conclusion, except in so far as they protracted the war and led to an increase of carnage. After ten years of a feverish and precarious peace, is not the time propitious for taking stock of the lessons which the war has to teach? Is it not also essential, if we are to read these lessons aright, and thus to profit from them, to strip ourselves bare of all prejudice and to detach our minds from minor loyalties to persons, policies and parties in order to kindle that greater loyalty to the Navy and the country as a whole? We may surely do this without casting a single stone at an individual, for we are all of us, even the greatest, but a bundle of imperfections and errors. Thus there is no room for personal animosity, for where no personal criticism is made, or attack levelled, the heart, the source of heat, is excluded from a discussion which should be the province only of the head.

The lessons of the war at sea seem to resolve them-

selves into three groups which may shortly be discussed under the headings, Strategical, Tactical, Material.

Strategical Lessons.

If the criticisms contained in the preceding chapter are just, the main strategical lessons of the late war are not difficult to apprehend. It seems very clear that the primary mission of the British Fleet, the mission for which its component parts should be definitely planned and constructed, is not, as is now almost universally preached, the patrolling of the trade-routes for the protection of trade. Rather is it the decisive and overwhelming destruction, incapacitation or capture of the enemy's main fleet, an action which carries in its train certain automatic consequences of which the principal fruits are strategical initiative in the land campaign and the now comparatively simple business of trade defence and the effective blockade of the enemy's ports. If this is so, it will be clear that the battleship is still, as always, the citadel of all effective sea-power, a citadel from which all other classes of vessel derive their power to range the seas steadily and consistently.

Because a decisive sea battle should be the chief concern of a navy that aspires to the establishment of unquestioned sea supremacy, a supremacy that is not unquestioned or *established* until such an action has been joined and victory obtained, it follows that such an engagement will be sought by both the fleets at

the first propitious moment if anything approaching equality of fighting strength exists.

If, however, one of the opposing fleets is materially too weak to face such a decision with any reasonable chance of success, what, it may be asked, can the weaker fleet do ? Why have a relatively weak battle fleet and why not, instead, forego battleships and develop a fleet of cruisers, submarines and aircraft and endeavour to harry the trade of the stronger sea-power under the very noses of the enemy's battle fleet ?

The answer to this conundrum, often now posed, is simple. A weaker, but still respectable, battle fleet to a great extent immobilises the stronger fleet just so long as it remains in being, and thus constitutes an ever-present threat, as did in fact the German battle fleet throughout the war, before and after Jutland. Furthermore, it may well happen that a strategical error on the part of the materially stronger battle fleet may give an opening to the weaker fleet to divide and defeat the stronger in detail. Not only so, but a perfectly trained and brilliantly commanded fleet may, though materially weaker, prove the fighting master of its opponent, as Englishmen, Frenchmen, Dutchmen and Spaniards have proved to one another's satisfaction and admiration in the centuries gone by. Were this not so, and if fleets are, in these modern days, to be measured on a strictly materialistic basis, competitive building is a sheer necessity and the maintenance of a relatively weaker fleet is waste of money. Thus

it should be the over-riding object of the stronger fleet to make the utmost use of any opportunity provided by the enemy, whether by accident, stratagem, or from sheer strategical necessity on his part, for a decisive action which will allow the subsequent dispersal of the victorious fleet for the close blockade of enemy ports in all parts of the world; the complete suppression of enemy trade; the almost complete security of our own trade from sporadic raiding by the defeated nation—the only subsequent risk to be guarded against; and complete strategical freedom in the land campaign. Pending this opportunity of decisive action, the defence of trade is summed up in the strategical platitude of concentration of vessels to be protected by *grouping*, and convoy where necessary, just as the concentration of the main fleet for action is essential while the enemy's main fleet is still in being, and thus a potential threat. Thus *concentration*, both for offence and defence, *pending* a decisive action, sums up in a word the strategical necessity, followed by that *dispersion* of effort after a fleet action which victory alone will make possible.

These, it seems, are the strategical lessons of the late war, which should enable all nations aspiring to sea-power, whether first or second class sea-power to determine the general nature of the fleets that will best serve their purpose. Should not a consideration of these matters convince the seamen of all nations that there is no short-cut to effective sea-power by foregoing battleships and substituting

fleets of very fast cruisers, submarines and aircraft, which can all be left in the air, so to speak, by proper strategical dispositions on the part of an adversary who possesses a properly balanced fleet of unspectacular vessels resting upon the orthodox battleship ?

Turning from the strategical to the tactical lessons of the war, we again need only consider the two leading events—the fleet action and the defence of trade—though a passing reference will be made to the Battle of the Falkland Islands and the Dogger Bank.

Tactical Lessons.

The most important tactical lessons of Jutland can be summed up shortly as follows:

The need of simplicity and elasticity in the organisation of the fleet.

The necessity of a simple signal organisation, for no other system can be expected to be reliable in the heat and damage of battle or of dealing effectually with any situation with which the enemy may present us.

The proper estimate of the tactical limitation of the torpedo as a weapon.

The re-valuation of the gun as the only vital weapon.

The relative unimportance of a small excess in speed. These tactical considerations will only be touched upon at this stage ; they will be considered in more detail when the author turns to his constructive ideas in the latter part of the book.

The lack of simplicity and the rigidity of the battle-orders which governed the Battle of Jutland are very generally admitted. Admirals in command of squadrons were bound to the fleet flagship to an extent which precluded them from acting on their own initiative when, as was almost inevitable in such a great fleet, the fleet flagship was not in touch with each situation as it arose. Thus one lesson seems to be the necessity of very flexible and greatly attenuated battle-orders, the development of a greater expectation of the unexpected, and thus a readiness to act independently of a signal, the absence of which is likely to be due to obscurity in the general situation in the fleet flagship.

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The necessity of a simple, *well-known* and elastic signal book is the natural concomitant of the foregoing, such a signal book, indeed, as existed some years previously to Jutland, the contents of which were known almost by heart by officers as well as signalmen. Here again the partial failure of the signal organisation at Jutland is well known. An efficient signal organisation seems to imply, not the multiplying of the means of communication, but rather the reduction of such means, and the simplicity of the few. Wireless, which led to some confusion at Jutland and during the night, and possibly to a weakening of executive authority by intervention from the Admiralty, should be regarded as an *auxiliary* means of communication, with visual

signalling, and particularly flag signalling, restored to its old place of pre-eminence.

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A true estimate of the limitations of the torpedo as a weapon is perhaps the most urgent need of all. It was the exaggerated fear of the torpedo which, more than anything, led to the failure of Jutland, and, it may be added, of the Dogger Bank. The torpedo, whether carried in destroyers, submarines, cruisers or battleships is, and must remain, a weapon of chance. As we now know, the dread of the submarine both at Jutland and the Dogger Bank was groundless. Mass attack by torpedo from surface torpedo craft can often, if not generally, be foreseen by the preliminary movements of the vessels carrying them, and can thus be countered by suitably disposed gun-vessels and, if the discharge takes place, by tactical means which should surely take the form of a turn *towards* the enemy rather than *away*. The chance of hits on vessels head on to the line of fire is remote indeed. It was the torpedo bogey that prevented the closing of the enemy to a range at which our great preponderance of gun-fire could have assured us a decisive victory before nightfall, and it was again the shadowy fear of the torpedo which kept the fleet from closing the German Fleet after nightfall when it passed astern and to safety. Perhaps the most vital need of the Navy today is to take up the torpedo by the gills, so to speak, and to look this pretentious bugbear squarely in the mouth. We shall assuredly find on closer inspection that

its teeth are false—that it carries in its mouth, in fact, a "denture."

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Next to the exaggeration of the value and power of the torpedo, the pre-eminence of the gun, when rightly used and controlled, is the most vital lesson of Jutland. It was the gun that sank and disabled our ships and those of the Germans. It was the gun-fire of our battle fleet at an efficient—a fighting—range that the Germans feared. The tactical lesson of Jutland with regard to the gun is surely, therefore, the necessity of allowing no material obstacle to intervene in closing the enemy to such a range that the gun can be brought into decisive action. There is no *via media*. No weapon or device can supplant the gun which, alone among weapons, can carry hundreds of rounds, and which can discharge its projectile at such a velocity, under such control, and from any relative bearing, so that escape from its effects is impossible when once within hitting range, and when hitting has been established.

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In these days when speed has become a god before whom all wise men are bidden to bow, it is inviting derision to question its efficacy as an aid to victory, and yet Jutland surely teaches us another lesson. Our battle-cruisers were a little faster than were the German. Our fifth battle-squadron was considerably faster than any German battleships: the *mean* speed of the Grand Fleet was slightly greater than the mean speed of the High Seas Fleet. In the

action, however, the value of the extra speed was not apparent, though the sacrifices made for it in armour and construction were considerable. Speed did not enable us to overtake our opponents and obtain victory at the Dogger Bank, neither was it effective in intercepting the raids by enemy cruisers on the East Coast. It is true that speed contributed to the victory of the Falkland Islands, but here the speed of our ships was very much in excess of the enemy, and, as emphasised elsewhere, the circumstances of this battle were entirely exceptional, the presiding genius being, not Lord Fisher's genius as is popularly believed, but an extraordinary element of luck reinforcing an overwhelming preponderance of gun-fire.

Does not the war in general, and Jutland, the Dogger Bank and the East Coast raids in particular, teach us that an extra knot or two over the speed of the enemy is a characteristic that plays an almost negligible part in the fate of sea actions when once joined? Does it not also show that a slight excess of speed will seldom enable an enemy to be brought to action if avoidance of action is the enemy's intention? If, on the other hand, the enemy is seeking action, the enemy's speed will merely hasten this desirable end at his own cost in speed instead of at ours. When once the action is joined the slight tactical advantage of a small excess in speed can be countered by the use of helm and tactical skill on the part of the slightly slower fleet, a fact well borne out by the German tactics at Jutland. The sacrifices

that must be made for each additional knot are very grave, and the trifling advantage accruing can be obtained with greater certainty, and at immeasurably less cost, by a *strategy* which compels the speedier opponent to face an action or to accept the cumulative consequences of inaction, and by skilful *tactics* when the action is joined. This question of speed will be reopened at a later stage, but it seems desirable to refer to it shortly when considering the tactical lessons of the war.

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The foregoing strategical and tactical lessons of the war, or what the author regards rightly or wrongly as such, have been confined to the fleet action. Before passing to the *material* lessons it is necessary to consider as briefly as so vast a subject will permit the lessons to be derived from the conduct of the campaign against the submarine. The necessity for this campaign on a great scale was, as has been shown, the direct outcome of the strategical deadlock brought about by the failure of Jutland, but the tragic effects of this failure might have been kept within narrower limits had the main German submarine campaign, well advertised in advance, been subsequently countered on sound principles.

The outstanding lesson of this disastrous episode is, of course, the necessity of concentrating merchant vessels into groups for defensive purposes in seas where enemy action, by cruiser, armed raider or submarine, may be anticipated. This simple strategical plan does not involve so vast an organisation

as is sometimes asserted, for the simple reason that in the outlying seas and oceans the fuelling bases are, for the most part, in our hands, thus strictly limiting the areas in which any consistent and protracted enemy action is possible. As a natural corollary of this concentration for defence, where defence is necessary, we can insure a concentration for attack where alone aggression is of any value to the enemy.

Because the speed of merchant vessels in company is low, it seems clear that the speed of British cruisers need not be very high, and most certainly not excessive, this reduction of speed making possible an addition of fighting strength on the same tonnage, with a great reduction in the cost of our cruiser construction, for it is the factor of speed above all other factors that has led to the staggering cost of our latest ships. Thus the only use the enemy can make of his excessive speed is to rush, at great velocity, into action with the defending cruisers which are his fighting masters. It is true that speed, if greatly superior, will enable an opponent to decline action with the convoy escorts, but if he does so he has surrendered one of the functions for which his cruisers presumably exist, and our trade goes quietly and steadily on. In any case, as has been pointed out previously, a slightly higher speed in our own cruisers will not enable them to engage their adversaries because, among other reasons which are in the lap of chance, full speed is not available at a few minutes' notice, a fact which is too often overlooked.

Emphasis has been laid on the defence of trade

against *cruiser* attack while ostensibly discussing attack by submarine. The reason for this seeming irrelevance is just this: the strategical principles of the defence of trade are the same whether the threat be from cruisers, armed raiders or submarines. If, however, the principle of concentration for defence is put into practice the submarine at once becomes the least important of the three forms of enemy action and for *tactical* reasons. The enemy cruiser, or cruisers, may overcome the protecting escort, in which case the whole convoy will fall into the hands of the victor, if he can subsequently shepherd it into harbour without further challenge. In the case of the attack of a convoy by a submarine, the worst that can happen, as the war proved, is the destruction of an odd ship in the convoy because the torpedo is the weapon of the submarine. She cannot with any hope of success engage the grouped merchant vessels with her gun if, as will always be the case, guns are mounted in a proportion of the merchant vessels for their own defence, the submarine being, as is well known, the most vulnerable of all vessels on the surface. She cannot capture single ships, let alone convoys, for she is unable to carry the necessary prize-crews.

Thus it will be seen that the submarine need not be regarded as an inevitable danger to trade, though it will always be a potential *threat* if the necessary and simple strategical and tactical counters are not patiently persevered with until such time as the absence of success against trade eventually breaks down

the persistence of the threat, as happened in the closing months of the late war when group-sailing had become widespread. Should not the German submarine campaign of the late war also teach us how unnecessary to counter it is a vast effort and outlay on material devices, involving a great personnel? Surely we have had blazoned on our minds, once and for all, the relative futility of material, no matter how ingenious or scientific, if employed to implement a strategy that is inherently unsound?

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MATERIAL LESSONS.

Leaving strategical and tactical reflections, it is now proposed to examine shortly some of the more obvious lessons with regard to *material*. For the sake of simplicity we may consider material under the following headings:

Guns.
Torpedoes.
Submarines.
Aircraft.
Wireless.
Ship construction.

The Gun.—The gun was the weapon that decided the war in spite of the obstacles that were allowed to intervene between it and its decisive use. Its failure at Jutland was not owing to any inherent defect. A striking lesson of the war was that the gun is not to be judged solely, or mainly, by its weight

and calibre. The German guns were, on the average, of lighter calibre than our own. Excessive range, that is to say a range greater than that at which experience tells us we can expect a reasonable percentage of hits, has nothing to justify it from our experience of the war, nor indeed from common sense. Excessive range, however, entails great elevation, which introduces grave drawbacks in construction and design. Great calibres, now increased to no less than 16 inches, involve great weight, and therefore great tonnage and cost in the ships required to mount them, and therefore fewer ships, short life, and great cost of replacement, and few shots in the locker. A reduction of calibre seems, therefore, to be one of the important lessons of the war. The need for accurate control is self-evident, but it may well be urged that simplicity of control was proved to be a necessity of any efficient control system, men and their nice judgment retaining pre-eminence over a multiplicity of mechanical devices which a lucky shot may put out of action, especially when concentrated in one locality. Furthermore, properly designed men of war are constructed with a view to destruction or damage piecemeal, and control therefore should harmonise with this characteristic.

The Torpedo.—Though the influence of the torpedo overshadowed the supreme actions of the war, the torpedo governed the war, not on its merits, but rather on the *pictures* of its potency which had gradually formed themselves in the minds of naval officers. As carried in surface ships it ignominiously failed to

achieve concrete results. Its devastating effects as used from German submarines against detached merchant vessels, and its partial success against men of war in early days, are no measure of its real value for, as has been shown, and as is perfectly well known in the Navy today, these effects could have been rendered trifling if the necessary strategical and tactical precautions had been taken at the outset. Does not the experience of the late war demand that this weapon should be frankly examined by those with no torpedo axe to grind with a view to its possible abolition from all surface vessels, and in any case from battleships and cruisers, especially when we realise the enormous provision of tonnage, depot ships and establishments that its existence in small craft entails, a provision which can only be met at the expense of exclusively gun vessels in days when economy is so essential ?

The Submarine.—It is with very mixed feelings that the author approaches the submarine, in command of which class of vessel he has spent the greater part of his career, and that part the happiest. His knowledge of submarines must be, from the nature of things, very extensive, and their powers and limitations must be intimately known to him. This experience, shared by submarine officers who commanded these vessels before, during and since the war, induces him to lay the greater emphasis on submarine limitations than on their potentialities. The author would be the last to overlook the passage of the Narrows and the brilliant exploits in the

Sea of Marmora—the dogged and dangerous patrols in the Heligoland Bight—the passage into the Baltic and the operations in these inhospitable waters—the ceaseless patrol in winter and summer of the seas and oceans round Britain, in pursuit of German submarines, under conditions of hardship which few who have not had experience of such work can fully grasp—the ceaseless attacks and hunting to which they were subjected by our own surface patrols as well as by those of the enemy—the terrible casualties suffered by the British submarines. All these matters are well known in the Navy, and it is a sure sign of the appreciation of the qualities of the more famous of our submarine officers that they are in large numbers passing to the highest ranks of the Service.

All these great exploits do not, however, alter by a hair's breadth the undoubted fact that the real achievement of our submarines bore little relation to the prodigious effort which their very extensive employment entailed. Considering our own submarines only, it is clear that they will never be employed in the piratical manner which Germany herself now deplores. It is true, however, that unless so employed they are singularly inefficient for interference with enemy trade for the reasons already given. This being so, can we not definitely exclude the submarine from our future construction programmes in so far as interference with enemy trade, or the defence of our own, is concerned.

Against the main fleets, our own submarines, like the Germans, failed, except in so far as they caused

an exaggerated fear which adversely affected Jutland and the Dogger Bank. This failure to achieve results against the British Fleet was the main cause of the deflection of the submarine from the function for which they were provided to the attack on trade.

Stress is now laid on the value of submarines for reconnaissance, and yet the reports of enemy movements obtained through submarine sources in the late war were singularly few, and, so far as can be discovered, in no single instance had a submarine report any influence on the campaign. Submarine reconnaissance was in fact redundant, or at the very highest, auxiliary.

It was against German submarines that the greatest submarine effort was directed, and it was here that the greatest positive achievement attended the effort, eighteen enemy submarines being sunk. But it should not be overlooked that this mighty effort, involving as it did fleets of submarines, thousands of personnel, and great casualties, was necessary only because the German submarine attack on trade was wrongly countered from the outset. The submarine effort was only one, though perhaps the greatest, of a variety of great efforts, all of which could have been reduced, if not totally foregone, had convoy and group-sailing been initiated at an early stage.

The presence, or the suspected presence, of submarines on patrol off an important harbour or strategical base is, on the other hand, a powerful deterrent to any plan on the part of an enemy to

carry out a deliberate and sustained bombardment, a landing or invasion in force, or a close blockade. In such cases it is clear that the enemy comes to the submarine (a species of mobile mine), and under conditions which reduce the inherent limitations of submarines to the minimum, giving full play to their latent powers.

With the foregoing considerations in view, the lesson of the war with regard to submarines seems to be this: Submarines are valuable vessels for defending important strategical bases and harbours against sustained bombardment, a landing of troops, or against close blockade, and, in the case of a neutral, for the vindication of the neutrality of their territorial waters against all comers.

England, on the other hand, requires few submarines for her own fleet, these few being employed for the defence of important, but isolated, harbours and bases where she may be in a very similar position to a weak naval power.

It also seems clear that it is illogical, unjust, and very short-sighted to attempt to limit submarine construction in foreign navies, because submarines can, in the future, be effectual only when used in a proper and natural manner.

Aircraft.—Little will be said at this stage on the question of aircraft as this matter will receive further treatment in a later chapter, but the lessons of the war are very clear. Airships, believed to be invaluable for scouting, were a failure. Their failure at Jutland was complete. Admiral Scheer's evidence

on this matter is final. They were the chattels and playthings of the weather; their vulnerability was extreme and the casualties were appalling.

Our own small airships, numbering as nearly as can be ascertained 103, met with casualties to 53 and their crews, again so far as can be ascertained. The number of men immobilised in the chain of airship stations round England was very considerable, as can well be believed when it is appreciated that 200 men might be required to house a small airship. The effort and enthusiasm of the airship officers is beyond all praise, but again the positive achievement is difficult to find.

Aeroplanes, employed in large numbers in the later stages of the war, were used like the small airships for patrol work and off-shore scouting for submarines. What little was achieved was achieved only by extravagant effort and at correspondingly great cost, and it is on record at the Admiralty that aireraft did less in sinking submarines than almost any other weapon.

With the fleet at sea little, if any, experience is furnished by the war, and no lessons in this respect are therefore available, except the valuable one that bombing of the stream of ships plying in the Channel and within easy reach of *thousands* of German aircraft was conspicuous by its absence for reasons which aerial enthusiasts are at liberty to explain ! One ship only in the war was struck by an aerial bomb, and that one without disastrous results. Of off-shore scouting and trade defence, the only work

of which the war gave us experience, we may therefore say this: for the protection of convoys aircraft are totally unsuitable, as indeed a consideration of their trifling endurance and a comparison of the minimum speeds of aeroplanes and the maximum speeds of convoys will convince anyone who pauses to reflect on what this fantastic disparity implies; for harassing submarines, and for forcing them occasionally to dive when on the look-out for prey, they have a certain limited value, but such activities can be more efficiently, simply and inexpensively undertaken by small surface auxiliary craft which can keep the sea for days, in all weathers, without relief and with certainty. Aircraft for trade defence are thus inefficient and in all cases *redundant.*

Wireless Telegraphy.—The outstanding importance of wireless telegraphy for naval purposes is taken for granted in these days, and yet the war reveals its limitations, and particularly its dangers, more strikingly than it exhibits its essential value. These limitations and dangers have been increased rather than diminished in the post-war years. During the war the transmission of wireless by ships at sea was strictly forbidden, except in emergency, and the necessity of maintaining "wireless silence" has since been increased by the improvement in direction-finding apparatus. Transmission on power is thus a source of grave danger owing to the divulging of a ship's position to an ever-listening enemy. On the outbreak of war "wireless silence" is, in fact, immediately enforced. Not only is wireless trans-

mission by ships at sea a source of danger, but its lavish use by the Admiralty tends, as the war proved, to undermine the executive self-reliance of commanders afloat.

Wireless, as is well known, is unreliable at certain periods, and in a fleet action it can almost certainly be jammed by an adversary. Not only can it be jammed, but it can be read and, as we well know, sometimes deciphered by the enemy, so that a state of uncertainty as to whether a cypher or code is "compromised" is ever present, and thus uncertainty as to the authenticity of perhaps a vital signal, as evidenced by the Admiralty signal of the course and speed of the enemy on the night of the Battle of Jutland. It is true that when action is joined the use of wireless ceases to be a source of danger in so far as the giving away of position is concerned, but gunnery, air-spotting and manœuvring signals can still be jammed, or even *forged* by the enemy, and, most important of all, the accuracy of a vital signal is dependent upon the unchecked accuracy of a single operator who is liable to err in the matter of everyday signalling, with results in battle that might at any moment be catastrophic.

Wireless *transmission* by submarine was seldom necessary, and only permitted in emergency, and, as has already been pointed out, submarine reconnaissance was of singularly little importance in the late war. Though the war taught us the grave limitations and dangers of wireless communication, it also taught us the value of what was then, but is

no longer, a new means of communication between ships out of visual touch, and in cases of distress when help is urgently needed.

The true lesson of the war with regard to wireless seems, therefore, to be this: Wireless is a *secondary* and not a primary means of communication, and the supply of wireless material, its personnel and organisation, should be adjusted accordingly. Visual signalling, particularly flag signalling, is in urgent need of being restored to its old position of priority, with all that this implies in masts, yards, and signalling facilities. All executive officers should once again be completely acquainted with important manœuvring and operating signals as in the days of the older signal books. Furthermore, the Navy should discontinue its elaborate participation in the wireless business of the outside world, stop its endless wireless research and experiment, and merely purchase its small but necessary equipment from civil sources, where, in all conscience, sufficient research and experiment is for ever going on.

Ship Construction.—There will be, it is believed, little dissent from the opinion that German construction was, on the whole, superior to the construction of our own heavy ships. The battle-cruiser action alone is sufficient warrant for the view, though it is unfortunately true that no test between the battleships was made available. The great value of armour was amply demonstrated, and the incomparable value of close subdivisions by water-tight compartments was well exemplified in the German

ships. It should be emphasised, however, that the Germans had this great advantage over ourselves in the construction of their battleships and battle-cruisers. Whereas our ships were built for *habitation* for long periods, thus necessitating large open spaces for living accommodation and mess-decks, the German ships, on the other hand, were manned to a considerable extent from barracks in which the crews were accommodated before going to sea. They were thus enabled to make a reduction in living spaces.

In a subsequent chapter certain proposals will be put forward for obviating this grave source of weakness in future battleships. The efficiency of the somewhat lighter calibre guns of the Germans seems to point to the desirability of adding to the armour and number of rounds carried, at the expense of weight in the gun and mounting. The total abolition of the torpedo armament from battleships and cruisers is admitted by all but torpedo specialists to be long overdue. No single hit from a torpedo fired from a heavy ship was achieved in the war. Furthermore, submerged torpedo flats add to the vulnerability of a big ship to a dangerous degree.

The necessity of contemplating closer ranges in the future affects very intimately the future construction of our ships. Closer range implies the strengthening of the side armour and of so placing it that its full effects are brought into play at what comes to be regarded as the mean fighting range, probably about 15,000 yards or less. Furthermore,

the contemplation of closer range would enable us to reduce the weight of gun-mounting and the constructional drawbacks inevitably involved in great gun elevations. A reduction of speed, a return, in fact, to the horizontal instead of the vertical portion of " the effort and attainment curve," seems to be of outstanding importance. It is that extra knot or two which calls for such a disproportionate increase of horse-power, and thus of weight and space, and which the war so clearly taught us to be of singularly little fighting value. This reduction of horse-power would enable us to strengthen very greatly the fighting and resisting power of our future cruisers and ships of the line. The need for the simplification of the gun control and the avoidance of its concentration in one locality seems to be clear, as also the careful avoidance of all machinery and instruments, no matter how ingenious and fascinating, where machinery or electrical control is not essential. This would imply a reconsideration of the wireless and gyroscopic paraphernalia which is becoming such a marked feature of the latest ships.

These seem to be the more obvious lessons that the war has to teach us in the matter of ship construction and equipment.

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In conclusion it must be admitted that a large number of naval officers will stoutly deny that the true lessons of the war are as here set forth. Indeed, the post-war policy of the Navy, as discussed in succeeding chapters, is in itself sufficient proof of

this strong disagreement. Few, if any, professional seamen will endorse all that has been said, but notwithstanding an inevitable difference of opinion on details, it is most certainly true that a large and growing body of naval opinion will tacitly assent to the author's criticisms of the late war, and to the lessons which past errors should teach us.

The widening cleavage in naval opinion is surely an echo, after a generation of unprecedented stress and *experience*, of that struggle between the doctrines of Lord Fisher and the traditional doctrine of the Navy, a struggle in which the victory went to that philosophy of which the late war, and the post-war Navy, are the natural offspring.

PART II

POST-WAR NAVAL POLICY: THE NAVY OF TODAY

CHAPTER IV

LESSONS OF THE WAR MISAPPLIED

IN the last chapter the author set forth what he conceives to be the true lessons of the war. He claims that his views are in no way singular to himself. Indeed, he knows that they are not, being, in fact, identical in broad outline with those expressed privately by many of our most brilliant flag-officers now serving on the Active List. Outside the ranks of the Naval Staff, and the extreme specialists, more especially the torpedo specialists in whose ranks are to be found the greater proportion of wireless and gas experts, the officers who will share these views have grown from a small minority into a definite majority. Even on the Naval Staff and in the specialist shore establishments the private views of officers are by no means universally in accord with the official views from which they can hardly be expected to dissociate themselves if they have a care, and it is a legitimate care, for the future of their careers. The true lessons of the war have not, however, been in any way reflected in post-war policy, as will be shown. It is true that the errors and failures of the late war are universally recognised, but the deductions drawn from experience by the disciples of Lord Fisher have been, as is only

natural, diametrically opposite to those drawn by the traditional school of seamen.

For the sake of clearness and simplicity the post-war naval policy will be considered in sections corresponding to those sections dealing with material in the preceding chapter, such a treatment providing, it is hoped, the clearest means of contrasting policies based upon two diametrically opposed philosophies of war.

Post-War Gunnery Policy.—In the gunnery branch, as in all other specialist departments, the evolutionary conception of progress has been strikingly in evidence, with the inevitable result of a growth in calibre, and thus in the range and weight of guns and mountings. Indeed, growth in size and weight is the outstanding characteristic of modernist material in all branches of engineering and organisation, ashore as afloat. Thus the calibre of the main armament of the new battleships, mercifully limited by treaty to 35,000 tons, has grown to 16 inches with the enormous weight of gun and mounting that such a calibre necessitates. Not only has the weight grown, but the range, involving increased elevation with consequent complication in the mountings, has increased to ranges fantastically beyond the range at which a reasonable percentage of hits, or indeed hits at all, can be obtained. As with the new 16-inch guns of *Rodney* and *Nelson*, so with the 8-inch guns of the new 10,000-ton cruisers. It will be seen, therefore, that action, or rather *bombardment*, is contemplated at ranges ex-

ceeding those which proved so singularly ineffective at Jutland. Indeed, the evolution of the weapon has converted naval gunnery into long-range bombing rather than effective gunnery in the proper sense of the term.

Reliance for *spotting* at these ranges is now placed upon aircraft, for clearly the human eye and human judgment are inoperative in the firing ship. The value of aircraft for spotting will be examined elsewhere, but it may be pointed out at once that a belief in the reliability of the aeroplane in a future action is, together with the torpedo scare, a direct cause of, and indeed the only justification for, weapons such as those to which we are at present committed.

It is clear that at these excessive ranges the angle of descent of the projectile is very steep, so steep, indeed, as to make a direct hit an occasion of almost startled surprise. Because our gunnery policy is entirely rational, *given the premises upon which it is founded*, it would certainly follow that the armouring of modern ships would be so arranged as to give the maximum protection at excessive ranges, and this is what, in fact, we find. Heavy overhead armour in *Rodney* and *Nelson* is provided, and the side armour is so placed as to provide its maximum protection at an excessive range. It must be pointed out, however, that gunnery officers originally advocated this particular armour as a defence against aircraft bombs, but this bogey being now mercifully laid, and aircraft bombing being recognised for the

futility it is, the heavy horizontal armouring of *Nelson* and *Rodney* is now defended retrospectively on grounds of very long-range action—in fact, bombing by guns. It will thus be seen that our latest battleships embody the new doctrine of long-range indecisive action in opposition to the old traditional doctrine of decisive and victorious action at proper fighting ranges. Alternatively, post-war material dictates the tactics of a future sea battle, for clearly the range selected, if circumstances permit, a big proviso, will be a range at which the ship will enjoy her maximum protection from armour. Thus does material now govern strategy and tactics.

The life of these evolved guns is short, thus entailing great cost in replacement, or alternatively insufficient practice with full charges at the range for which the ship is primarily designed. The inordinate weight and size of projectiles seriously reduces the number of rounds that can be carried, though an almost limitless number will be required to effect a decision at the ranges contemplated, a fact that is emphasised by the miserable percentage of hits obtained at the lesser ranges at Jutland or at the Battle of the Falkland Islands, where the enemy was opposed to us in hopelessly weaker ships and at a range which rendered the opposing guns almost useless.

A natural corollary of the extreme ranges provided for is an intolerable growth in those fire-control complications which have now reached a state at which the latest fire-control table costs a

sum of money which, if named, would hardly be believed. It is significant, however, that the bulk of the scientific instruments included in this table depend in the first instance, as they must always depend, upon initial *estimates* by the human eye and brain. Thus, like so much of "modern science," extremely costly and ingenious instruments, and prodigious effort, are employed to deal scientifically—or in other words accurately—with initial premises based upon speculation or upon observations which are, in fact, inaccurate. This curious phenomenon is a matter of common conversation and mirthful ribaldry among naval officers who are not involved as specialists in the use of these particular instruments.

The ramifications of modern fire-control are so extreme as to necessitate the employment of troops of young ratings to mind, to operate, and to interpret the instruments, a state of affairs which involves two demonstrable sources of weakness. In the first place, operations and reports of the first importance devolve upon a large number of young lads, any one of whom may make an error that will have disastrous effects on the firing. There are, in fact, innumerable links in a weak chain, not one of which can err with impunity. In the second place, extreme concentration of control of the main armament is inevitable, not only for material reasons, but also on account of the necessity of supervision of the dozens of instrument operators involved. Thus a luckily placed round by the enemy may well put

the whole gunnery organisation out of action, and render these vessels as vulnerable to smaller ships as was Goliath to David.

Not only in the primary armament of battleships, but in their secondary armament, and in the primary armament—the 8-inch guns—of the new cruisers, the complications and ingenious devices are so numerous as to have become a byword in the Service. Among all the new specialist ratings involved the actual gun-layers have sunk into the undignified rôle of machines, their magnificent skill and judgment having been replaced by instruments controlled and set on the information offered by a variety of junior ratings, often boys.

The term "failure" is admittedly a relative term, and yet the almost universal judgment of those officers at sea whose job it is to use and handle the post-war guns and mountings, as opposed to those at the Admiralty who project and evolve them, is that they are failures—white elephants. Their cost, however, is in inverse proportion to their efficiency, a phenomenon invariably to be met with when we set about evolving scientific marvels, a fate that has overtaken the gun which, in less "progressive" days, was not a marvel at all, but just a highly efficient, simple, long-lived weapon of precision. Thus in our present gunnery policy, strategy and tactics have been forced to conform to the weapon, instead of, as in other days, the most ideal weapon that existing knowledge allowed being selected with care and discrimination, and finally designed to be the obedient

servant of a sound, and therefore unspectacular, strategical and tactical plan.

Post-War Torpedo Policy.—If very modern gunnery, evolved from originally sound principles of war, has led us into the production of white elephants, what may we not expect of a torpedo policy reared upon principles which have been fallacious from the day when torpedoes were first invented? It need hardly be said that the torpedo itself has been given an excessive range and has expanded to a great girth, having reached, in fact, 24 inches in diameter and a range that still further reduces the pre-existing unlikelihood of a hit.

It has been shown that the torpedo in the late war was a failure in surface ships, except in so far as it excited a fear, amounting almost to panic, which adversely affected all naval actions. This failure was recognised by torpedo specialists, as it could hardly fail to be, but the action taken to deal with the failure has been exactly what is to be expected when specialists dictate policy. The specialist can with difficulty, if at all, be brought to see that the weaknesses of his speciality are *inherent*. The 24-inch torpedo is a monstrosity, involving as it does disabilities in handling and use which precludes its employment in small ships and which can only be met by mechanical devices for power-loading and power-handling. Tactically, as will be clear to a layman, the increased range proportionately accentuates the small prospect of a hit. The slightly greater effect of the increased explosive charge, if by

great good chance a hit was obtained, has already been discounted by the bulging of the entire battle fleet at a cost which, though great in money, is greater and more serious in its effect of further diminishing the already inadequate docking facilities, even in this country. Battleships without adequate dry docks are anachronisms, for no risks could be taken in an action because trifling underwater damage might prove irremediable. Herein lies the secret, in great part, of the Singapore scheme, and the necessity of constructing and despatching the enormous floating dock to the Far East. Before the bulging policy was implemented the graving dock already at Singapore, as well as docks in this country and elsewhere, could have received every battleship in the British Navy, mastodons though they were apart from the bulges.

The inherent disabilities of the torpedo, as a weapon of precision, have led to a construction programme, and a form of tactics, designed to employ these costly and inefficient weapons in shoals, a hundred or more being fired simultaneously in the hope of attaining one or two hits. Indeed, torpedoes, at great cost, are constructed in thousands, though their life in times of peace is short owing to the incessant evolving of a new "Mark," differing from its predecessor in some trifling respect. The new "Mark" goes into production, to use the current jargon ashore and afloat, and so the evolutionary game goes merrily on.

But the torpedoes themselves, and their cost, are

relatively a trifle—only a few millions—when compared to the cost of the vessels constructed to employ them. Submarines and T.B.D.s (nominally destroyers, but primarily torpedo boats and thus a partial contradiction in terms) are an extravagantly costly form of construction, the cost of these vessels having risen to approximately £350,000 apiece, almost half of the cost of a 15,000-ton battleship in pre-Dreadnought days. The T.B.D.s, in spite of their appalling cost, are little, if any, faster than destroyers built twenty years ago. Not only is the provision and maintenance of fleets of vessels to carry the torpedo a great financial burden, involving, owing to their extravagant cost, a more than proportionate decrease in tonnage available for mounting the only real weapon, the gun, but depot ships and establishments for repair, maintenance and supply of torpedoes, and the small vessels that mount them, are a serious burden.

The torpedo itself is, however, one only of the activities of the torpedo branch. The mine, an immobile machine, is an instrument of never-ending experiment, "research" and therefore of change, though its efficiency, and general nature, is not changing for the better. Furthermore, the paravane has to a great extent rendered the mine obsolete, though the existence of the paravane has little effect in abating the zeal of the mine enthusiasts. *Standardisation*, long overdue, is impossible with mines, as with all other naval material, owing to the vast organisation created for the sole purpose of un-

ceasing experiment and change. The torpedo branch has now made itself responsible for gas warfare, on which more will be said later, and from its loins have sprung the new specialisms of wireless telegraphy and anti-submarine devices. Every device and branch of freak warfare, dear to the heart of Lord Fisher's ideal, the sailor-engineer, gravitates automatically into the fostering care of the torpedo branch.

As though uneasily aware that the torpedo and mine, and latterly gas, are not of sufficient importance to engage the undivided attention of a great, elaborate, and outstandingly able branch of the Navy, the torpedo branch has usurped the natural province of engineers by undertaking the design, maintenance and repair of the electrical equipment of the Navy, a form of activity which is entirely inappropriate to executive officers, who in such matters are, as they should be if at heart they are sailors, amateur and not professional engineers. The extent of this amateurishness is all too plain when we see the fantastic growth of electrical equipment in modern vessels.

Men of war are designed and constructed, or should be, with the idea of being destroyed bit by bit, totally destroyed possibly, partially destroyed certainly, in a real battle. Electrical equipment partially destroyed is a menace, not only materially, but because we have learnt to rely on it and shall be lost without it.

So powerful has the torpedo branch become, and

so all-pervading its tentacles, that the essentially *sea-going* officers, those officers, in fact, whose misfortune it is to have to *use* all this stuff instead of evolving it, seem powerless to simplify their ships, an operation universally advocated at sea. Torpedoes, gyroscopic paraphernalia, and wireless sets innumerable are forced into cruisers and battleships in spite of the growing protests of non-torpedo officers. The fear of the torpedo, in spite of the lessons of the late war, has been so sedulously fostered that it may be said truthfully that this chancy weapon dominates the Navy. The fear of the torpedo, greatly exaggerated when correct tactical and strategical precautions are taken, has affected the design of all our ships, either by the bulging of our older ships or in the guns, ranges, and therefore armouring of our post-war ships. Gunnery policy is definitely, if unconsciously, the victim of torpedo propaganda.

The author speaks with no animus or prejudice. Indeed, his career has been cast among torpedo and submarine officers in whose ranks he is happy to claim the great majority of his personal friends. The torpedo has been his weapon from the outset of his career, and his experience of it is great. He has also served for four years in the Torpedo Division of the Naval Staff, in which capacity he has gained as close an insight into the torpedo specialist mind as is humanly possible. The true lessons of the war with regard to torpedo warfare have been referred to in the preceding chapter, and these lessons are

hardly controversial. The action that has been taken with these lessons in mind has been such as seems logical, indeed inevitable, to men who believe in evolutionary mechanics, and who, as extreme specialists and "sailor-engineers," rather than as liberally minded professional seamen, control policy. It is upon the torpedo branch more especially that the materialistic mantle of Lord Fisher has fallen.

Post-War Submarine Policy.—As in all other forms of naval material, in submarine policy we again see objective evolution at work, and in a manner so clear and acknowledged as to provide a startling commentary on that conception of indefinite mechanical progress in a particular machine which evolution seems to assume.

At the conclusion of the war many classes of submarines had been constructed, and hundreds of these vessels had been built. The war had revealed to us their possibilities as commerce destroyers in an *unsound strategical plan*, and it had also proved to us their extreme and narrow limitations for all purposes, legitimate as well as piratical, when properly countered. These narrow limitations are *inherent*, as has been shown, and as is frankly admitted by experienced submarine officers; limitations which can only be still further accentuated by growth in mere size. We had had nearly twenty years of experience with these vessels in 1918, including in that period four years of war in which money was poured out like water, and in which the experience obtained was the equivalent, as with aircraft, of perhaps fifty years

of peace operations. The steam engine, as fitted in the K class, had been tried and had failed, a failure leading, after much opposition, to the scrapping of the K class as a whole, with the exception of a new *experimental* steam submarine, K26.

The Diesel engine had enjoyed a very thorough trial before and during the war, and was, as it is today, a type of propulsion whose slight advantages and grave weaknesses for marine as opposed to submarine propulsion are perfectly well known to our highly competent engineer officers, and in no need of this ceaseless research. The ideal form of hull, the limiting factors of tonnage and length for maximum all-round efficiency, the internal arrangements for operating purposes had all reached a stage in which discriminating selection from known data rather than a feverish outburst of experiment and research was called for. Simplification and standardisation with the resulting economy was the obvious need. The earlier L class of submarines had reached a standard of excellence which could only be improved upon by *simplifying* still further their internal mechanism and by doing away with heavy and costly mechanical plant employed to do work that could be more simply and satisfactorily done by hand. Submarines had, in fact, reached the saturation point of material efficiency. But finality in the achievement of a saturation point of efficiency in any *particular* mechanical means of achieving an object seems to be a doctrine now intolerable to all men, whether ashore or afloat, and

since the war research and experiment are believed to be capable of providing unceasing improvement in any mortal thing. At any rate, " the evolution of the submarine "—the term regularly employed—has taken place before our eyes, and with what results ?

X1, costing now nearly 1½ million sterling, is a failure, not only from a material point of view, but, what is much more important, from the strategical and tactical aspects. She is a submarine without a mission. She was frankly experimental, but experimental for what ? The Naval Staff were actually asked by a Rear-Admiral of Submarines to define her functions, but they were quite frankly unable to do so. The two remaining M class (M1 was lost with all hands) have now been deprived of their 12-inch guns, which, from the day they were conceived by Lord Fisher and his staff, had been notorious white elephants, though spoken of throughout the country as " triumphs of science." These two vessels are now fitted out as a mine-laying submarine and as a submersible aircraft carrier to carry one baby seaplane. This latter vessel, now regarded as the very latest " scientific marvel," is more of a freak, if that is possible, than in her original rôle of a 12-inch gun vessel, and what the cost of these transformations may have been the author prefers not to contemplate.

Passing to what are humorously called " the improved L class "—the L50 class—we get a striking demonstration of " the evolution of species." These

costly craft are in all respects inferior to their predecessors, and with the same horse-power and tonnage have achieved a loss of 5 knots in speed, though designed to be faster. This reduction of speed is not, it must be emphasised, of great importance, except in so far as it demonstrates the retrogression of modern progress.

K26, another exceedingly costly experimental craft, is an improved " K," though the principle of steam-driven submarines has in the meantime been condemned, and the earlier and less expensive K class has been broken up.

The new O and P classes, larger it need hardly be said than the L class, but built for the same general purposes and embodying an enormous wireless paraphernalia, have been as costly as they have so far proved mechanically unsatisfactory, the first two designed and constructed for service in Australia failing ignominiously to get beyond Malta until they had undergone, a few months after completion, a complete reconstruction. They have now been paid off. As in all other classes of modern construction, the O and P classes of submarine were evolved at enormous cost into a " box of tricks " from a class which, if refitted and simplified where necessary, would have been ideal for our strictly limited submarine requirements for many years. Instead, the still sound old L class are being broken up.

The truth is that British submarine construction is without a policy, except in so far as a sort of mechanical evolution is a policy in itself, and the

reason for this lack of a coherent policy is clear. It passes the wit of man to devise a reasonable use for British submarines beyond the limited uses referred to in the preceding chapter. Here, once again, the lessons of the war have been misapplied, while the British policy, or lack of policy beyond mere construction, has led to international confusion and recrimination on the whole submarine question. The British proposal at Washington for the abolition of the submarine, and subsequent proposals, have naturally been laughed out of court, particularly when it is known that Great Britain has been busy building new submarines, thereby showing that we still presumably regard the submarine as a potentially powerful vessel. Should not the Admiralty have given a clear lead on this vexed question by the cessation of new submarine programmes, retaining for minor purposes a sufficiency of old submarines which would have served our purpose with perfect efficiency for many years to come? Such a policy could not have failed to impress foreign countries and lead them to question the wisdom of their own inflated submarine programmes.

In conclusion, it must be pointed out that depot ships, those ineffective vessels which eat up tonnage and funds that should be available for fighting ships, are, like everything else, assuming gargantuan proportions, as a study of the new submarine depot ship, *Medway*, costing over a million sterling, and the old depot ships still in existence, and notably the *Cyclops*, well illustrates. The submarine is merely

one of the many means of exploiting the torpedo, and, as in all things connected with the torpedo, the organisation at the back of torpedo warfare, as with aerial or gas warfare, is out of all proportion to the value of the weapon itself.

Submarines require relief crews, stowage for their spare torpedoes, elaborate workshops for their complicated machinery, and accommodation for the whole personnel. For all these purposes the depot ship exists because submarines are not, and cannot be, self-contained vessels.

The gun, on the other hand, requires no auxiliary organisation whatever, the vessels that mount this weapon being completely self-contained, and therefore free for years in all parts of the world. Such vessels merely raise steam and proceed, a very different proceeding to that necessary for all forms of torpedo, mine, aerial and gas warfare, which involve, and provide the chief excuse for, the existence of large staffs at the Admiralty and in the shore establishments.

* * * * *

Post-War Air and Gas Policy.—It must be confessed that considerable difficulty arises in any attempt to define naval policy with regard to aerial and gas warfare. A valiant if rather pathetic attempt has been made to ride two horses at the same time. No one knows better than naval officers the gross and lamentable exaggeration and propaganda that have surrounded and inspired these two forms of freak warfare, for such they are. Leaving out of account

the land aspect of aerial warfare, its *proved* and acknowledged futility for *defence*, and its identity with indiscriminate assassination and sabotage naked and unashamed, and dealing only with the naval Air Arm from which this modern vileness and futility of indiscriminate — necessarily indiscriminate — bombing is absent, the impracticability of serious bombing under real sea-going conditions is perfectly well known. Naval officers are aware that bombs cannot be accurately aimed, and that the belief, carefully fostered in the public mind, that huge bombs will rain down on battleships is childish for the simple reason that, apart from aiming disabilities, such bombs cannot be lifted or conveyed in quantity to the scene of action. Furthermore, they know that the comparatively harmless effect of dropped bombs, *owing to the non-confinement of the explosion*, is a matter of experience. Hundreds of heavy bombs imply hundreds of bombing aircraft. Whether in artificial displays of bombing London, or a target ship, the same few aircraft are employed again and again. No bombs are dropped, indeed they are seldom carried, petrol, instead of bomb load, being the cargo ; but the talk about what they *would* have done, coupled with the sight of the aeroplanes overhead, gives to the unreflecting or lay mind the terrifying vision of a ceaseless hail of death. The supply of aeroplanes overhead, from the few hundreds we now possess after an outlay of £250,000,000 as opposed to the scores of thousands in our hands and in the hands of our opponents in

the late war, is insured by the simple expedient of using bases conveniently near, to and from which a few aircraft pass back and forth, in fine weather, in rapid, easy and unopposed short flights.*

The grave imperfection of aerial navigation out of sight of leading marks or surface vessels is admitted, as of course it must be, by the Navy, thus rendering long-distance scouting for an enemy, not *known* to be in the immediate vicinity, a poor substitute for reconnaissance by surface vessels as well as being a source of extreme danger to the pilot and observer. Short-range reconnaissance in the presence of cruisers is for the most part redundant. Aerial spotting for fall of shot has been proved again and again, and notably in the famous *Monarch* firing carried out under perfectly ideal conditions, to be not merely a broken reed, but a positive source of confusion and thus of danger, as all those who, like the author, witnessed this firing are compelled to admit. Again, in the display before the Dominion Premiers, the spotting aeroplanes reported " shorts " for " overs."

Spectacular attacks by torpedo-planes (the latest vehicle to exploit the torpedo) are carried out under conditions fantastically divorced from reality, and, even so, attack of any sort from aircraft carriers is only possible under good conditions of weather.

* The facts about the number of aeroplanes available, and produced, in the late War, are to be found on pp. 194-8 of *The Great Delusion*. The figures would be incredible were they not official and undisputed. The casualties in four years in 103 air raids were 1,413 killed; a fifth only of one year's fatal casualties from motor accidents.

The case against the air myth, at sea as well as ashore, as set forth coldly and unanswerably in " The Great Delusion," and more recently in " This Bondage," is admitted in the Navy today, as it was to a great extent before those books appeared. And yet what has been the post-war policy of the Navy ? On aircraft carriers and their " wisp " of aeroplanes (for the aircraft that can be employed from these extraordinary floating aerodromes are no more than a wisp), and on that vast organisation at the back of the most trifling aerial effort, tens of millions have been expended. Our ships and guns have been designed with a view to aircraft co-operation, and it is freely admitted that without aircraft in view our ships and their weapons would have been of very different design.

With one voice the Navy proclaims (*pianissimo*) the fantastic exaggeration that surrounds all aerial propaganda, and with the same voice (*fortissimo*) it proclaims the dawn of the Air Age at sea and the outstanding importance of the naval Air Arm ! Since, however, a pound of practice is worth a ton of precept, it must be assumed that the prodigious expenditure on carriers reveals that naval criticism of extravagant aerial claims is half-hearted, and that the Navy's belief in a vast aerial future is much the same as the belief of those whose livelihood and prestige depend absolutely upon the sustenance of this queer modern myth. The Navy seems to have been persuaded by shouting, against its better and saner judgment, and by the fear of being branded

as "Noahs," that the future of the country lies in the air, *but in the air over the sea.* Thus the quarrel over the naval Air Arm has assumed in the eyes of the public the appearance of mere professional jealousy, while the great outlay of naval funds on the naval Air Arm confirms the public in the view that naval criticism of the Air Ministry is the pathetic and expiring cry of a jealous, worn-out and mediæval service.

As with the air, so with its concubine—Gas. All sensible *and disinterested* naval officers know perfectly well, and say so, that gas clouds discharged by ships upon the wind is an ecstasy of unreasonable warfare, for tactical as well as material reasons. The use of gas-filled shells against opposing ships is regarded by gunnery officers as an absurd waste of valuable rounds, and it can hardly be doubted that no such shell would be fired when it came to action. The object is to sink the opposing ship. Mustard gas can only be troublesome, if at all with reasonable precautions, *after* the battle is lost or won. Gas spread from aircraft, the modern bugbear preached largely by the chemical industry, overlooks among many other things the exorbitant weight of the cylinder, and the consequently trifling puff of gas that the aircraft could transport and discharge. One glance at the sky above us should serve to check that fear of the aircraft's puff of nasty breath—for such relatively it is—a puff discharged a great distance from its target and the slave of the wind. The laying of a little mustard gas cannot, as before stated, affect the issue of the action.

All these facts are a matter of common knowledge and talk in the Navy, and yet preparations for the use of gas, and elaborate defence against it, go steadily on, and for the usual and inevitable reason. A large experimental gas station, with its attendant organisations at the Admiralty and elsewhere, has been instituted, and under the capacious cloak of the torpedo branch, now reaching out its tentacles to Salisbury Plain of all places, we find naval officers and scientists exalting their own speciality, pushing its interests and, most sinister of all, hawking and employing the wares of the chemical industry which, it need hardly be said, is adequately represented on the Chemical Warfare Committee, a fact which naval officers and the public, in their virginal innocence, defend as a most natural and proper proceeding. Schemes transcending the wildest schemes of Laputa—the softening of marble for the manufacture of pin-cushions; the extraction of sunbeams from cucumbers, and so forth—are set in motion by these gaseous professors. Horse-boots are "tried out" on galloping quadrupeds by naval officers on the Plains at Porton. Indeed, the question of a change of equestrian bootmakers was a very burning one a few years ago, and "research" into the reasons why the horses trod down their heels was zealously pursued. This is no jest, as it may appear, but a sober, or rather drunken, fact. Gas-masks for carrier-pigeons was an important "research question," when the author was last in touch with this branch of naval warfare, though whether science has now

found a solution for the comfort of the horses and pigeons the author cannot say. Knowing the *patience* of all "research," and the necessity for this patience in a world overstocked with 'scientists' but inadequately supplied with jobs, he is inclined to doubt it.

Acres of fuel oil are spread upon the seas in an endeavour to float a little mustard gas into harbours on the flood tide because, fortunately or unfortunately for the purveyors of the oil and the chemicals, mustard gas *sinks* in sea water, which is thus a natural defence.

In the face of such an organisation is it to be wondered at that naval policy becomes progressively stained with aerial and chemical projects, and that the gas offensive finds an early echo in the construction and internal economy of our ships? Gas-proofing of compartments, air-purifying machinery, gas-masks by the thousand, and the abolition of voice-pipes (by far the most efficient and reliable means of intercommunication) follow easily and naturally the recommendations of the gas "experts" and manufacturers. And yet, strange to say, no sober-minded naval officer sets the slightest store by gas warfare at sea. In the presence of the specialist and "man of science" a sort of fatalism settles down upon the Navy, and these costly, troublesome and fantastic innovations are accepted as inevitable and in harmony with "Progress" and "the New Age," as indeed they are.

Post-War Wireless Policy.—Here, as in all other

branches, the Navy has fallen into the hands of the extreme specialist in control of policy. The limitations, not to mention dangers, of wireless communication are common knowledge and have been referred to in a previous chapter. In exact harmony with present philosophy, our wireless experts endeavour to surmount, or irradicate, these *inherent* defects by never-ending experiment and research, with the inevitable consequence of ceaseless production of new sets or new instruments. It is " the wireless age " and that settles the matter. Notwithstanding the widely acknowledged superiority of flag and other forms of visual signalling for all purposes other than communication with ships out of visual touch, or on foreign stations (a form of communication which duplicates the sure, secret and already existing system of cable, and which is seldom really required) the *means* of visual signalling, and the signalman's art, are rapidly disappearing from the Navy to give place to a jamboree of wireless sets and an organisation that is as vast as it would be redundant in the absence of the superfluity of wireless material. Ships have contracted the habit of literally chattering to one another over the ether, and it is doubtful if one signal out of twenty now sent is of any importance whatever, as a most cursory study of any wireless log will reveal.

The Signal School, a child of that fertile, indeed fecund, mother " Vernon," has grown into a great experimental establishment in which no less than twenty-three scientists and thirty " techni-

cians," assisted by a large staff of naval officers and ratings, repeat and duplicate the work of thousands engaged in that wireless "research" taking place ashore. It is indeed difficult to say just where naval wireless ceases and the Post Office and Marconi's activities begin. It is doubtful if any invention in the history of the world, with the exception of aeronautics, has benefited from, and battened on, public funds to an equal extent. Had wireless telegraphy and 'commercial' flying been compelled to establish their exact places in the scheme of things on their own merits and by the operation of the laws of economics, they would never have achieved the extraordinary and anomalous position which they now enjoy, and we should have been spared those ever-recurring and unsavoury scandals which are as native to these enterprises as is water to a fish or air to a bird. They would long since, after nearly thirty years of development, have filled an important, though small, niche in the system of modern communications, the precise niche being settled satisfactorily for all of us whose tastes and opinions inevitably differ, by that infallible judge, jury and executioner "economics" which knows nothing of rationalisation, protection, subsidy or State enterprise.

In no department of the Navy is it more essential to return to the old-fashioned practice of relying upon civil sources for the supply of material. The claim sedulously, and indeed quite naturally, fostered by wireless specialists (scientists as well as naval officers) that naval wireless requirements are of such

an exceptional and peculiar nature that " research " on naval lines, and by the Navy itself, is essential, has nothing whatever to support it. Wireless in extreme moderation should exist for the Navy and not, as now, to an absurd extent, the Navy for wireless.

It is a source of unfailing and amused remark among non-wireless specialists—for specialists are quite rational about the other fellow's specialism—that the necessary wireless gear could be obtained cheaply and satisfactorily from civil sources without any assistance from the experimental branch of the Signal School. The urgent need of simplification and reduction of the vast wireless organisation and its material is generally admitted, but here, as in all other departments, the organisation is too strong, and from the nature of its composition it is incapable of reforming itself and unwilling, quite naturally, to reduce or efface itself.

Post-War Construction Policy.—Construction can be divided into two branches—the reconstruction of Jutland ships and new construction. In considering first the reconstruction of our older battleships we get a singularly clear view of the manner in which the lessons of Jutland have been acted upon. The fear of the torpedo, in spite of its notorious failure, is clearly revealed in the bulging programme subsequently undertaken. In spite of immunity of all our first-line ships (except *Marlborough*, which was torpedoed and in the battle sacrificed 2 knots of speed only), though Jutland was fought in a narrow

sea under ideal conditions for torpedo craft, and with hordes of torpedo craft opposed to us, the ukase went forth that all our battleships must be bulged, with results that are strategically devastating. Surely it is better to have a powerful unbulged fleet that can proceed anywhere and fight anywhere than a bulged fleet which is useless, or thereabouts, if proper docking facilities are not available? The deliberateness with which this policy has been forced through is striking. It is as though a woman carefully measured her front door and then proceeded to alter, or purchase, her perambulator so that it could not by any possibility be squeezed through the portals.

The cost has been very great, and the more costly and questionable features of the Singapore scheme are a direct result of the bulges, for the old graving dock, as has already been said, could formerly take all British battleships. The Singapore scheme will be referred to shortly elsewhere, but it may be pointed out here that its most controversial features have arisen from the necessity of providing for bulged ships, and the new 35,000-ton battleships, rather than from any previously existing or inherent strategical disability in the Far East.

Having at such a cost bulged the battle fleet and having thus, according to official pronouncements, rendered these ships largely impervious to underwater attack, it might be supposed that the torpedo bogey had been to some extent laid and that we might at least lay that as an asset against the debit

account of the strategical disabilities with which the bulges have saddled us, but such is not the case. Nothing today, in the Navy or ashore, is clear-cut, definite and final. Confidence and finality are lacking in every new policy as soon as the policy has been implemented with material or action. The fear of the torpedo kept us out of decisive range of the German Fleet at Jutland, but, bulges notwithstanding, still longer ranges are now provided, for the guns and armour are designed for action far outside torpedo range.

But reconstruction is by no means confined to the bulges. The original masts, funnels and bridges of the fine and comely-looking Queen Elizabeth class (five in number) have vanished to give place to erections and accretions which are as hideous as they are retrograde. Wireless gear and elaborate and innumerable gyroscopic and other instruments are the principal causes of the dismantling of these once fine ships, and yet, by very general consent, their fighting qualities have not been improved, whatever may be the opinion of those enthusiastic materialists at whose behest this extraordinary reconstruction has been carried out.

In the older ships, however, the enthusiasms of the specialists have been kept within some bounds by sheer necessity. The ships could not be redesigned and rebuilt from truck to keelson. In new construction no limits existed to circumscribe the zeal and activity of the naval staff, so that in the ships built since the war the full blast of the new evolu-

tionary mechanics has been experienced. And to what has it led ?

The *Rodney* and *Nelson*, costing approximately £8,000,000 apiece, are a species of craft which, by common consent, will never again be allowed to disfigure the sea. Their dimensions are such as to preclude their employment in parts of the world where new floating docks and specially constructed dry docks are not available for their reception, and in this respect they are in harmony with the older bulged ships.

Their mountings are a source of continual anxiety and constant refit. Their armour, as already emphasised, is so placed as to provide its maximum protection at excessive ranges. So concentrated is the fire-control machinery that a single luckily placed shell might well put all nine 16-inch guns out of action. Their triple turrets are unsatisfactory, and the life of these monstrous guns is deplorably short. The number of the heavy rounds carried is certainly short of those required to undertake an action at the ranges for which the ships and their guns have been primarily designed with any likelihood of a decision.

Submerged torpedo flats in the fore-part of the ships are installed, for what precise purpose it is difficult to see, though as a source of danger they are obvious, especially as the whole 16-inch armament is forward. Internally the ships resemble a science museum more closely than a man of war, the complication being well-nigh infinite.

The secondary armament, twin 6-inch, mounted in turrets and crowded into the " Oiler "-like stern of the ship, is a welter of mechanical contrivances, and a definite retrogression on the secondary armaments of fifteen years ago, the twin 6-inch mounting having proved itself, many years ago, a thoroughly undesirable form of mounting. Furthermore, a lucky shot will put them all, bag and baggage, out of action.

The ship's company, in spite of the ship's being exclusively oil-burning, is no less than 125 officers and 1,300 men, a great personnel being required to mind the countless instruments and to work the modern " labour-saving " devices.

The new 10,000-ton cruisers, costing over £2,000,000 apiece, are notoriously not fighting ships at all, unless the extreme, indeed fantastic, ranges for which their high-angle 8-inch guns are designed enable them to escape any punishment from the enemy. These queer ships resemble liners rather than cruisers, and it is not surprising that this confusion actually arose in Shanghai a few months ago. They might be described as boiler-cases, 80,000 h.p. being boxed in between thin steel plates, so that a well-placed 4-inch shell from a destroyer might prove exceedingly unpleasant to these strangely evolved cruisers.

The new cruiser-minelayer, *Adventure*, is an adventure indeed into the unknown, for her rôle still remains an open and hotly debated question at sea. The author, though not, he hopes, of an unduly

timid disposition, confesses frankly that his heart would be in his mouth if he went into action in this vessel employed as a cruiser with a great cargo of mines on board.

The new repair ship, *Resource*, costing approximately £1,000,000, is an anachronism. Her large ship's company is totally inadequate for the operating of the repair machinery. Her blast furnace uptakes are a source of grave anxiety. Her function cannot be defined, and what she is to repair nobody knows.

The new destroyers, each costing in the neighbourhood of £500,000, have given trouble and anxiety owing to the excessive boiler pressures and superheat employed. And yet these costly craft are little, if any, faster than the old coal-burning destroyers of a quarter of a century ago.

The post-war submarines have already been alluded to in some detail. Mechanically they are retrogressive and strategically they are without a mission.

Of the aircraft carriers, some of new construction and some reconstructed from Lord Fisher's costly and famous freaks, *Courageous*, *Glorious*, *Furious*, the less said the better. What they have all cost from first to last it would be difficult to compute. These ships, like all the new ships, are in an everlasting state of refit, redesign and generally of flux. "Propping up the dockyard wall" is the naval expression for a large portion of their activities. When it is considered that the fighting armament of these

vulnerable monsters consists of a few aeroplanes, it is time, surely, that we paused to take stock of our position and to inquire into the destination or horizon of this ungovernable, and therefore ungoverned, "Progress." May we not, in this class of vessel at least, learn a lesson from America which, after an expenditure of £18,000,000 on *Lexington* and *Saratoga*, has come to the conclusion that they are obsolete?

Turning aside from specific classes of ships constructed or reconstructed in the post-war years, it seems desirable to refer to certain aspects of modern engineering which are common to them all. We find excess, the hallmark of our generation ashore as well as afloat, in every department of naval construction. Excessive weight, range and calibre of guns; excessive torpedo equipment; excessive electrical equipment; excessive fire-control machinery; excessive mechanical complications generally. Perhaps the most notable excess of all, however, is to be found in *horse-power*. No serious attention seems now to be given to that point at which increased power becomes progressively and rapidly inoperative. Modern cruisers and destroyers are stuffed as full of boilers as is a Christmas pudding with plums. Not content with over-boilering these ultra-modern ships, the boilers themselves are designed for excessive pressures and superheated steam.

Though the sacrifice in fighting qualities that must be made for this excessive horse-power is obvious, it might be thought that we should at least see our

ships leaping through the water at speeds which make older and more conservative shops look tortoise-like, but it is not so. Cruisers and destroyers built years ago compare very favourably with our present ships, and on a relatively trifling horse-power that must fill the evolutionary mechanicians with a pity bordering on contempt. The reason for this lack of achievement is not far to seek. A certain length and tonnage of hull can absorb, so to speak, and utilise economically a certain horse-power and no more. When this point is reached an increase of tens of thousands of horse-power will have only a trifling effect, even *on paper*, while in practice, with a ship's bottom slightly foul, or a trifling head sea, the extra speed vanishes altogether.

The truth, of course, is that modernist engineering, like modernist effort in all departments of life, is carried out on the vertical portion of what has been called elsewhere the " Effort and Attainment Curve." This practice, due to the extraordinary penetration of the great engineering profession by men who, for some unexplained reason, call themselves and are called by laymen, scientists, is demonstrably responsible for all the post-war " scientific marvels," both in the Navy and ashore, the chief characteristic and accompaniment of which is a startling decline in fighting power and in the prosperity of old-established and basic industries in which true progress, as opposed to mere change, is not possible, except, of course, in perfection and economy of *administration.*

Those civil critics of the present Navy who denounce its ideas and its costliness, but who, by their words and acts, make it plain that they share with naval officers the new creed of evolutionary mechanical progress, are entirely illogical.

Naval policy during the past generation should, by such critics, be defended and championed and in no single particular condemned. Naval officers have merely exhibited to the world a single-minded devotion to that ideal of "Progress" which is shared by their fellow-men ashore. The ideal is admirable, but its application is, in many respects, indistinguishable from retrogression in the post-war world.

Any man, on the other hand, who may feel a certain disquietude, or who may be disposed to think that the author has unnecessarily exposed certain weaknesses in naval material as it exists today, may rid his mind of any apprehension in this respect. All the features of our ships that have been discussed and criticised are perfectly well known, and exist, fortunately, in perhaps an even more marked degree in foreign navies, and more particularly in the American Navy, of which Lord Fisher was the father as he was of our own.

CHAPTER V

THE NAVAL STAFF AND EXTREME SPECIALISM

A NAVAL STAFF, on the grand scale, is an innovation. It is in no way in harmony with our great naval tradition, which was the embodiment of that ideal form of individualism which compels each member of a society to be responsible for his own particular duty, be it great or small, while giving the benefit, and the credit, of his individual effort to the good, not of himself, but of that society as a whole of which he is a highly individual member.

The Naval Staff as we now have it was, like the submarine campaign, one of the many unfortunate products of the failure of Jutland. Its formation was a tacit admission that Jutland was a sorry business, and the argument ran, and still runs among enthusiastic staff officers, somewhat thus: Modern fleets have become so complicated and so specialised, and modern strategy and tactics so incalculable and intricate, that no single man afloat, and no small old-fashioned Board of Admiralty ashore, can be expected to handle a modern fleet unaided or to administer a modern navy unadvised. The failure of Jutland is partly excused on the ground that a staff, as we now have it, was non-existent in 1914, and it is seriously believed that a staff on modern

lines insures that such a disaster will never occur again. Here, as usual, we see universal agreement, though unacknowledged publicly, on the dismal failure of Jutland, but here once again we see the diametrically opposed conclusions drawn by the two opposed schools of thought.

The author and a great body of naval officers in no way agree that the failure of Jutland is to be in any way accounted for by the absence of a great staff of advisers. As already shown, this failure is to be laid at the door of an unsound doctrine of war combined with a failure in that very material in which the false doctrine had its roots.

It is not, however, intended to debate the matter further, but instead it may be of interest to examine in some detail the nature and activities of that great and growing staff which is such a striking and evolutionary feature of our modernist Navy. It must be emphasised at the outset that Lord Fisher, an individualist if there ever was one, never contemplated the present Naval Staff. It is one of those inevitable by-products of " Fisherism " that Lord Fisher never foresaw.

After Jutland, and while the German submarine campaign was maturing, the skeleton of the present staff was installed at the Admiralty, a skeleton shortly to be covered with very substantial flesh as the submarine campaign progressed. There is no need to dwell again on the nature of the countermeasures that this much-vaunted staff set in motion, or the organised opposition of the same staff to the

institution of convoy. The story has already been told and it is not a happy one. In the post-war years the staff idea, and its organisation, like material and weapons, has grown to proportions which are a byword ashore and afloat. It finds its counterpart in the other fighting services, in offices of State, and in the Church, as well as in great post-war industrial undertakings, and very notably the railways.

Scores of commanders and captains are now employed at the Admiralty to advise the Board on every conceivable strategical, tactical, administrative and executive matter.

Flagships at sea are not without resemblance to floating Admiralties, staff officers teeming and jostling one another like corporals in the Portuguese Army. The shore establishments bulge with lecturers "on the staff." Officers swarm in the staff colleges, war colleges and tactical schools, while the Imperial Defence College, the latest creation in the staff line, is a Pelion piled upon a series of Ossas. In truth the Navy has gone ashore to the Universities of Precept; the School of Practice—the Sea—receiving progressively fewer scholars and, latterly, fewer candidates.

Now what are the more striking results that we may reasonably look for in a staff-ridden Navy? First and foremost we may expect to find, as we most certainly do, a dangerous relinquishing of personal responsibility, and the substitution of dull mediocrity for the possible, though not certain, extremes of

brilliance and incompetence. The staff is, in fact, another aspect of the new " Safety First " doctrine.

Brilliance, individuality and initiative, whether in tactical and executive command at sea, or in strategical and administrative policy at the Admiralty, are apt to be choked and stifled under those mountains of paper, reports, " theses," and " operation orders," which are implicit in great staff organisations.

An incompetent or nervous Flag officer (if such a one exists), on the other hand, receives just that support of organised mediocrity which prevents such incompetence from exposing itself in times of peace for all to see and appreciate. This is said in no disrespect to Flag officers—indeed, very much the reverse, because the author, like all members of the traditional school, is intensely loyal to the conception of his Admiral as a man apart, a man with grave responsibilities which few can shoulder and none should share, least of all a batch of officers of the author's comparatively humble rank. In other days, the Admiral was generally known throughout the fleet by some queer, and not infrequently disreputable, nickname, sure sign of individuality and force of character. The Admiral, now seldom with a nickname, as the chairman, so to speak, of a committee of experts, does not however impress the author or, be it said *sotto voce*, the Navy as a whole outside the ranks of the staff with that old half-fearful regard which in robuster days surrounded the personality of the Commander-in-Chief

and other Admirals afloat. Indeed, the staff officer himself, from perpetual association with Flag officers, is apt to lose his wholesome respect for and fear of his seniors, and the habit of criticism of senior officers in messes and elsewhere is inevitably fostered to the detriment of true discipline. At the Admiralty it is the same story: decision and responsibility melt away into indecision and irresponsibility. But this is not the only evil that is inherent in an excessive staff organisation, especially in Whitehall where policy is decided.

Individual staff officers are specialists almost to a man, and the Divisions of the staff, in their turn, are specialist as a Division. Thus when new construction is projected, its nature, its armament and its equipment are "put up" to the staff, each highly specialised Division of which is invited to "state its requirements." There is no need to describe the process of "stating requirements" in detail; it is inevitable that each specialism states its requirements in no uncertain terms, and in a manner commensurate with what it deems to be its prestige. Need we be surprised that post-war vessels, with "staff" blazoned unmistakably upon their curious appearances, have become, by common consent of those at sea in them, floating museums for the housing and display of every conceivable specimen of specialist fanaticism. Not only in professional matters but in the very games and recreations of officers and men "staff-work" and organisation have largely supplanted old-fashioned individualism,

with all the attendant evils that arise when we raise sport and recreation to the position of a great organised competition with the serious business of a man's life. *Panem et circenses* never yet kept either a nation or a profession great. Surely grown men can at least amuse themselves without the help and coddling of a staff wet-nurse.

It is true that *in theory* the staff has everything seemingly to recommend it. A picture is drawn of a body of brilliant thinkers, coldly and dispassionately considering and weighing every item of a programme on its merits, and finally laying before the Board a perfectly balanced plan or proposal for their Lordships' final judgment, correction or, if necessary, rejection. But things are not in practice always what they appear likely to be in theory. Staffs are in reality composed of average and ordinary folk inspired with the fanatical zeal of the specialist rather than with wisdom from on high. Rejection, or even serious amendment, of a scheme on which the staff juggernaut has been at work, perhaps for months, is almost impossible for members of the Board, for such action would cause the well-oiled wheels of a closely interlocking and enormous organisation to creak and groan, like a grain of sand in the bearings of a mighty mill-wheel.

Writing as a staff officer of four years' experience —a not inconsiderable experience whatever may be said to the contrary—the author has often wondered what the Controller of the Navy must think when he is faced with the amazing " requirements " of a

specialised naval staff over which he has no shadow of control or right of criticism, beyond a flat refusal to proceed with a type of ship which the whole staff organisation is unanimous in advising. Resignation or compliance, with perhaps some mild criticism of a few details, are the alternatives with which he is faced.

There is, however, a staff evil which is perhaps more insidious than all others, because it is less tangible, and this evil is a moral one. Officers are appointed to the Naval Staff to *think*, and as a result of their thinking to *advise*. Advice to their senior officers is definitely one of the stated terms of their appointment. Is it just or wholesome to place comparatively junior officers in this relation to their seniors upon whose good opinion of their professional, or rather thinking, capacity their future careers and fortunes depend? It is true that in the majority of cases naval officers, like all other men, are not of an analytical, and therefore critical, cast of mind, the great majority assuming, with Professor Panglos, that all is for the best in the best of all possible worlds. Such officers, however, though frequently first-class seamen and executive officers, are clearly of little, if any, value as advisers, being indeed mere clerkly automatons for registering and abetting what they conceive to be the views and wishes of the Director of their Division or of the Board. But there is always a minority who are of a naturally reflecting, and therefore potentially critical, nature, and to such a minority a position on the Naval Staff

is an ever-recurring dilemma. The mind that is indeed a mind cannot be disciplined or circumscribed to accept prevailing or popular views, and must, from the nature of things, especially in a Navy containing as it now does two strongly opposed philosophies of war, be continually in a quandary. Is such an officer to swim with the current of proposed policy, or is he to oppose it with all his skill of argument and with what is in reality true loyalty, rather than disloyalty, to his profession?

On this matter it is often argued that no senior officer will take exception to opposition if *tactfully* displayed, but surely it is clear that such opposition, if the *tact* is not a synonym for colourlessness and mere weakness, will reveal to the senior officer a professional view which he must of necessity regard as wrong, and therefore dangerous to the best interests of the Navy, because it differs diametrically from his own which he very naturally supposes to be right. Furthermore, all men, especially naval officers, being human, the strong intellectual disagreement will, as likely as not, generate heat, in which case feeling begins to enter into what originated as a purely intellectual difference. If this is so, a reasonably and quite properly ambitious officer will almost of necessity keep his views to himself, plausibly persuading himself that in a higher rank he will be able to make a stand against the stream. But the belief is ill-founded. In the next rank he will be in the same dilemma, and a habit of thought

and conduct will be formed which must dog him to his retirement, no matter how high he may climb or how far he may wade.

Thus it seems that the real value of a large staff of commanders and captains is illusory on these grounds alone. The non-critical are clerks, the keenly and loyally critical are muzzled or broken, and the Juggernaut proceeds on its well-oiled career.

It need hardly be said that this moral dilemma was seldom, if ever, presented in earlier days, when the vast bulk of officers were serving at sea, for at sea, then as now apart from the staff, strict obedience, zealous executive work and practical professional capacity alone were and still are expected, and criticism or advice was neither invited nor expressed by officers fitted for promotion to the higher ranks.

But there is yet another aspect of a great naval staff that assuredly deserves the earnest consideration of naval officers concerned for the fighting, as opposed to the paper, efficiency of their profession.

What of the executive and sea-going efficiency of junior staff officers? It is true that in its ranks are to be found a proportion of commanders and captains to whom staff work is, comparatively speaking, but an incident in their career. There are, however, a greater number that pass from staff job to staff job, shore job to shore job, reaching the rank of captain with no experience of command whatever,

and little, if any, of responsible executive work. It is a curious fact, but none the less true on that account, that staff duties, while concerned with matters of first-class importance in every sphere which used to devolve upon the broad shoulders of Flag officers alone and unaided, involve no *personal* responsibility whatever in the juniors. Thus a spurious atmosphere of excessive gravity and solemnity, as though grave responsibility was the lot of the staff, surrounds them like a halo, to the immense amusement of all but themselves. All the while the junior staff officer's capacity for executive command and personal responsibility, only to be obtained by life-long practice and experience, may be wanting, though it is likely to remain undisclosed owing to the existence of an organisation which inevitably shields from observation his practical and executive shortcomings. Thus may an officer pass to the highest ranks in an odour of professional sanctity. He has never made a mistake, and been made to suffer for it, and therefore has nothing to profit from.

The foregoing reflections do not indicate that in the author's view there should be no staff. The nature of the greatly reduced staff that seems necessary will, however, be discussed at a later stage.

In conclusion it may not be amiss to recall to the memory of those officers who served in the old *Britannia* as cadets the words of that wise old history instructor, Mr. Hamilton Williams, known affection-

ately as "Badger Bill" and now gathered to his fathers. Can we not recall how we were ordered to stand up in the class-room at attention and repeat three times in a sonorous chant, at Badger Bill's bidding:

"Councils of War never Act."

CHAPTER VI

TRAINING OF OFFICERS AND MEN

THERE probably has never been a time when so much attention has been given to "education," or such prodigious effort and outlay expended on its prosecution. As ashore, so afloat; officers and men, from the day they join the Service as small boys, are fodder, so to speak, to the educationist and instructor and, be it whispered, to the faddist. Boys and girls are being progressively taught *what* to think rather than *how* to think.

In "the bad old days" of a generation ago education, so far as Lower Deck ratings were concerned, terminated for the most part in the training ship, where however it was sound and thorough, in the three famous "R's," though voluntary classes in the dog-watches for the few who were zealous in the pursuit of further theoretical knowledge was provided, often by officers who interested themselves personally in the men's welfare. Possibly, though by no means certainly, too little attention was given to book-learning, but there was certainly no lack of training in professional matters. Indeed, seamen were never out of training in the hard school of experience and daily work. Practice rather than precept was then the creed, for officers as well as men.

Progressively in the last few years, however, precept and abstractions have largely ousted practice. In the ever-increasing shore establishments, and in the diminishing ships at sea, officers and men alike are instructed hour by hour in the theory of this, that and the other. Nice mild-mannered young men, well groomed and excellently intentioned, sit in rows to undergo instruction on the *psychology* of discipline, on the nature of the mind and, *mirabile dictu*, on the nature and growth of the amœba and of the anatomy of the human form. In the shore establishments years of a 'seaman's' career are occupied in the acquisition of specialist technical knowledge suited perhaps to engineering students in a technical college, but utterly divorced from the great profession of the sea. The evil is notorious inside the Navy, giving rise to anxiety and to attempted palliatives among discerning naval officers.

The truth is that Upper Deck ratings, still known by courtesy as seamen, are now without a trade. There are few seamen left—all hands, officers as well as men, have become mechanics and engineers, though amateurs as such. It is with a feeling of shame that many of the more senior officers watch the handling of any boat, even a motor-boat, by modernist boats' crews. Most officers will admit that the decay, the galloping decay, of seamanship is in no way confined to the men, whose deficiencies as seamen are merely a reflection of the deficiencies of their officers. Many naval officers, though only those of the now predominant material school, maintain

that seamanship, as that word is generally understood, is no longer required in a modern and up-to-date navy, a herd of mechanics in dungaree suits being the real necessity. Officers of the traditional school know very well, however, that first-rate seamanship is the natural and primary trade of all executive officers, petty officers and men, and that a man who is a practised seaman, under sail or steam, is not only saturated with sound sea-sense, but has acquired those liberal characteristics of judgment, nervelessness and ready wit which will render all specialist duties in connection with weapons or machinery mere child's play, after a little instruction, to the first-class seaman.

The converse, however, is notoriously not true. Intensive mechanical training from boyhood can never make a seaman, though it does breed, singularly enough, a secret contempt for seamanship and for those destroyer and "salt-horse" officers to whom seamanship is native and excessive mechanical specialism anathema.

Very much more than it is intended to say might be said of the deplorable decay of seamanship in the Royal Navy, but it may be as well to point out at once that England, once the great exponent of the seaman's calling and art, is among the few nations that have abandoned the practice of making their officers serve their apprenticeship to the sea in a full-rigged ship. The Royal Merchant Marine, from which in many vital respects the Navy has a lot to relearn, is rich in officers, young as well as

senior, who have circumnavigated the globe in windjammers. The author has little doubt that Merchant Service captains will bear him out in asserting that sail is still the ideal schoolmaster of the sea, and that its pupils as boys, who will gravitate naturally and properly into steam and motor ships, have gained nothing but lasting good in that hard and liberal school which has made English seamen what they are, or were, and what in any case they may once again become.

Before leaving the subject of the training of officers and men, it is desired to refer very briefly to the system of entry and training of cadets imposed upon the Navy by Lord Fisher. The outstanding features of this system are well known. Boys of thirteen years and four months are marshalled before an Interview Committee, upon which devolves the grave responsibility of deciding, on the strength of a few minutes' interview, whether a boy may or may not devote his life to the sea in the Royal Navy. How such an interview of boys totally undeveloped in mind, character, and even appearance, can be expected to settle satisfactorily the question of future fitness for such a calling as the sea, the author, and now it is believed a definite majority of naval officers, is frankly unable to see. It may be admitted at once that no system can be infallible where the human mind and character are involved, but to the majority of naval officers the Fisher system seems to be, of all others, the most open to criticism.

Those who lay stress on the value of the school-

masters' reports would be wise to reflect that schoolmasters are not infallible in the judgment of boys' characters in years to come, and that in any case the schoolmaster's report is without any standard, and depends upon the idiosyncrasies of the men themselves. The same applies to the Interview Committee. Even supposing that the boys' characters were accurately estimated, an absurd supposition, it is still true that some admire, or emphasise, certain characteristics which others do not admire or by which they set little store. In short, given the same data, some would choose one boy and some another. Not only is the age very young for such an inquisition, an age at which brass buttons and a peak cap have a natural glamour for mothers and little boys, but, what is much more serious, the interview system as the principal selective method involves a grave injustice on parents and children by excluding from a profession hundreds of boys on the mere whim of a committee. In no civil profession in the country are aspirants for a great profession treated in this arbitrary manner.

A common saying in the Navy runs: "Give me character and not brains," perhaps as thoughtless a slogan as it is possible to conceive. What sort of character it may be asked? Character surely ceases to be character as soon as it can be classified. Is a mind above the average in native wit the likely concomitant of a depraved or mean character? Certainly the existing system of entry is admirably conceived for avoiding inquisition into the native

ability of the boy, perhaps the only characteristic that is ponderable at the age of thirteen, a mere qualifying examination, slightly stiffened up it is true in the past few years, being considered sufficient after the grand elimination has been made by interview. Thus a naval cadetship in the days of the *Britannia*, a prize indeed, has ceased to be any such thing. In earlier and less *psychological* days, character was taken on trust as the natural heritage of a normal English boy, and that particular character, rightly or wrongly attributed to English seamen, was recognised as the result of their life and discipline at sea and not of the initial selection. Is the character of the senior officers now in the Navy noticeably less desirable than that of the juniors? Surely not, and yet the senior officers were selected, not on the new psychological principle, but on the principle of open competition after a nomination had been obtained.

It is sometimes claimed, in defence of the existing system of entry, that the passing-out standard at Dartmouth is very high, higher indeed than the standard achieved at a similar age by average boys at the public schools. If this is so, as well it may be, it is sufficient to account for the mental indigestion and premature cessation of reflecting capacity that is noticeable among many officers, for it seems clear that if the initial standard of native talent is, to put it at its highest, not above the average, the subsequent pressure of modern technical and mathematical instruction can only be superficially absorbed.

Indeed, to a detached and interested observer it seems plain that excessive technical and specialist training imposed prematurely on minds in no way above, and in many cases considerably below, the average, must be held partly responsible for that growing slavery to machinery which is so sure an indication of an intellect that has been cramped and stereotyped by specialism and technical training prematurely imposed upon an undeveloped, and therefore unreflecting, mind.

CHAPTER VII

SCIENTIFIC RESEARCH

TO speak and think of "scientific research" with an awe bordering on reverence is the present vogue. To criticise it adversely is regarded as something akin to impertinence. To ridicule it as a modern superstition is blasphemy. Scientific research has, in fact, become a creed.

If all things in heaven and earth, from the noblest to the meanest, if all human activities, from the greatest to the most trivial, are now regarded as useful spheres of activity for salaried research workers, it would be unreasonable to suppose that the Royal Navy could have escaped the new "profession" of science. In fact it has not escaped; on the contrary, professorial activity has intruded into every department of naval material, administration and training, while its influence has cast its deadening shadow over the minds and the very language of executive, medical and engineering officers.

Incredible as it may seem, the old malady of sea-sickness is now a subject of earnest and patient research at the sea-sick and air-sick research laboratory at Holly Hill, to which scientific establishment of the Air Ministry it was proposed by the Naval Staff to send British seamen who, in increasing numbers, suffer from *mal-de-mer*. This scientific

project was killed, though only at the eleventh hour, by the ridicule of a few determined officers who still regard the sea, rather than research, as the means for dealing with sea-sickness.

In other and saner days it was the business of the great professions, manned by men with years of *apprenticeship* in practical work, to apply, to exploit and to develop to final perfection new discoveries. It is a striking fact, and one almost universally overlooked owing to the general acceptance of the extraordinary claims of organised "science," that discovery and invention continue, as always, to be the gifts to the world of original and highly individual minds totally unconnected with organised or salaried "research." Steam was discovered by an artisan; dynamic electricity by the son of a blacksmith; pneumatic tyres by a veterinary surgeon; automatic weapons by the son of a gunsmith; artificial silk by a poor man who died a pauper; a vital steel process by a clerk in a solicitor's office; the aeroplane by amateurs; the telephone by a doctor; and so forth. The development of these discoveries or inventions we owe entirely to the appropriate trade or profession. In no single instance, so far as can be ascertained, does the world owe any valuable discovery, as opposed to *speculation*, to a man who, at the time of his discovery or invention, was regarded by himself, or spoken of by the world, as a scientist. Faraday himself stressed this point in his own case. Sometimes the discovery of a new thing, or of an old law new to the knowledge of the world,

is achieved by a professional man to whose profession the new discovery is native. More often, however, discoveries are the outcome of inspiration, as opposed to research, in the mind of a complete layman, the development and exploitation of the new idea being naturally entrusted in the past to the appropriate profession. Today "modern science" and professional "scientists" lay claim to the products, the titles and the functions of the engineering profession in all its branches.

Who are these gentlemen who call themselves "scientists"? What are their qualifications for intruding themselves into the professions manned by skilled and experienced professional men? What, it may be asked, is meant by this abused term "science"? How does a "professional scientist" define his own functions and his profession? "Science" means knowledge—just that and no more. To think or speak "scientifically" is to do so *accurately*. That is all. How then can science be a profession, or a man be a "professional scientist" except in the sense that a cook who can *consistently* turn out a perfect—that is to say, an accurate—omelette is a "scientist," and, it may be added, an extreme rarity? To assert that to every action there is an equal and opposite reaction is to assert a fact: to state that it is a *scientific* fact is merely to use two words where one will suffice. So with Newton's First Law of Motion or Boyle's Law—they are just facts, not added to or subtracted from, by calling them scientific. "Science," if we must use

the term, must confine itself to facts or cease to be science. Speculation which does not, and in some cases cannot, conclude with discovery is not science. A theory is, at its highest, but a seemingly reasonable speculation, so that "a scientific theory" is an almost childish contradiction in terms.

Theories which work, theories which enable men to produce or observe unvarying phenomena, or to make exact predictions which stand the test of experiment and experience, cease to be theories and become those *laws* within which practical engineers or professional craftsmen (artists) were used to confine their activities, gradually perfecting their appliances or material within those limitations prescribed by those laws which, prior to the advent of "modern science," were recognised as absolute, fixed, eternal. Variations were the variations of individual craftsmen and artists who never dreamed of straining or overstepping the natural limitations within which, and with ample margin, they plied their craft and their art.

But organised "modern science," and its natural concomitant organised "research," has changed all this. That we have in England a small number of brilliant men of "science" needs no emphasis, but men and women now go "into science" just as in other days they entered the genuine professions. Because "science," however, cannot, from the nature of things, provide a *natural* career for average men and women who, with all due respect to them, are no more scientific than their lay brethren, we

find a great army of nominal scientists penetrating the professions and, on the strength of some academic degree which any man of ordinary intelligence could obtain if he so wished, assuming a status to which their practical and professional inexperience in no way entitles them.

Those who, like the author, have been intimately in touch with scientific research for many years, and who have thus been in a position to see the effect of this latter-day crank on naval material, and indeed upon material of all kinds, can hardly have failed to notice the unhappy results of this vicious influence. Hulls, machinery, instruments, devices, weapons, explosives, gas, aircraft, sea-lions, hydrophones—all show the cloven hoof of scientific research, represented by a huge bureaucratic department presided over by the usual Director and Administrative Staff, and manned by no less than sixty-two gentlemen called senior and junior scientists and sixty-eight further gentlemen known as "technical officers." Outside scientific circles the idea of senior and junior scientists not unnaturally provokes merriment. It is interesting to speculate on the status of Sir Isaac Newton or Faraday at the age of twenty-five in a post-war research organisation. At the Signal School alone, of all places, no less than fifty-nine of these gentlemen are employed, while in the Vernon, Mining School, Anti-Submarine Establishment, and Gas Experimental Station at Porton (all foster-children, including the Signal School, of the Torpedo Branch) scientists and technicians swarm. On the

Chemical Warfare Committee, or attached thereto, is a further regiment of scientists with a leaven of gentlemen engaged in Imperial Chemicals and other financially interested firms.

It would be of interest to know the number of " scientists " and " technicians " (whose exact professional status it is hard to determine) now in receipt of State salaries throughout the country. The sum voted annually for research was no less than £4,045,000 in 1926, and is doubtless, like all other public extravagance, increasing. Mr. Ramsay Macdonald's most ardent admirers have surely never associated with his name the habit of scientific, that is to say accurate, thought, and yet he has recently been elevated to a Fellowship of the Royal Society. It must be a matter of surprise to others besides the author that this feverish research requires state maintenance for industrial purposes. Surely the great industrial concerns can be trusted to support research adequately if they are alive to their own interests, as they most certainly may be trusted to be, though the very recent practice of conferring the F.R.S. on certain modernist Captains of Industry would seem to suggest that the advantages of " research " are not even yet adequately appreciated by orthodox Industry.

As previously emphasised, this spectacular intrusion of professional science into the engineering and mechanical world is responsible for the transference of effort, construction and design from the horizontal to the vertical portion of " the Effort

and Attainment Curve." Where sound, efficient and therefore economic engineering practice stopped short in pre-war days, " science " and " research " have stepped in, carrying with them, alas ! the great engineering profession into projects conceived and carried out on the vertical, and therefore inefficient and uneconomic portion, of the curve. It is a matter for no surprise, therefore, that dividends in the old-established industries, and fighting efficiency in the Navy, become progressively conspicuous by their absence.

Modern science, the modernist title for what was once called engineering, regards it as a natural proceeding to squeeze 1,500 h.p. into a flying cockleshell. Scientists, not engineers, are responsible for the ridiculous airship comedy * and other costly aerial mare's-nests, involving of necessity the hoodwinking of innocent and credulous Cabinet Ministers. It is regarded as a sign of progress to provide a small motor-boat with sufficient horse-power to drive two great cargo vessels a distance of 300 miles a day for weeks in succession. It is considered to be " scientific " to provide a flimsy cruiser of 10,000 tons with 80,000 h.p., 40,000 h.p. of which cannot be absorbed by a vessel of her length. Nothing strange is seen in the construction of locomotive juggernauts necessitating the strengthening of permanent way and bridges to pull half-empty trains at speeds comparing unfavourably with speeds of forty, and even eighty, years ago. It is regarded as

* Since converted to tragedy overwhelming and complete.

a sign of the triumph of modern science that guns should be given ranges twice as great as the maximum visibility of a target hull down on the horizon. Freakishness, excess and abortion are the hall-marks of this queer Progress. Freak battleships, freak cruisers, freak submarines, freak carriers, freak repair ships, litter the sea, or to be more strictly accurate, the dockyards, where they are in a perpetual state of repair, re-design and change. Freak guns, freak torpedoes, freak compasses, freak wireless sets are crowded into these freak ships. Is it to be wondered at that industry languishes and the cost of a Navy, with 45,000 less personnel than in 1913, is literally staggering? Need we be surprised that queer gas projects take root and gather momentum, or that anti-submarine devices, useful and efficient within their strict limitations, are evolved to extravagant proportions which are marked by a loss of efficiency proportionate, as usual, to the extravagant increase in size, complication and cost?

It is not suggested for a moment that the Scientific Research Department is directly responsible for all these excesses, though it is directly responsible for many. The evolutionary idea involved in modern research has penetrated the Navy as a whole, not excluding the professional engineer officers themselves. It need cause no surprise to learn that junior wireless ratings, of the rank of able seamen, have recently applied to be drafted to the Shore Establishments to engage in patient research work. And why not? Their practical qualifica-

tions are at least as high as those of many so engaged.

How can a man be *set*, so to speak, to discover or evolve something? To discover or evolve what? For what is he searching backwards?—*re*-searching? The truth, of course, is that this *re*-search, this delving backwards, finds itself immediately up against the impenetrable riddle of life and matter, with the natural result that research workers, to a man or woman, develop into those Projectors and Innovators whom Swift has immortalised, and gibbeted for all time, in Gulliver's voyage to Laputa. Change, more change, then mere change, are the inevitable fruits of this salaried research, because, lacking inspiration for discovery, the patient research worker must show something more concrete than mere patience or the gargantuan and verbose volume of the annual "Progress Report."

Is not the time ripe for taking stock of this research craze? Is not a revolt against this insidious penetration of the great engineering, sea-faring, medical and agricultural professions, and of the Christian profession, by professional scientists a matter of urgent national importance?

CHAPTER VIII

IN BONDAGE TO OIL

"IT is an open secret that during the Great War there were occasions on which the ships of our fleet, with their boilers burning oil, were in serious straits for the fuel necessary to enable them to put to sea; if all, or even a majority of our merchant ships, had been dependent on oil, the importation of essential supplies of food and material must have been much more gravely jeopardised than it was, because in the absence of oil the vessels on which we relied would have been unable to move."

So speaks *The Times* on April 29th, 1926.

If such was the case in the late war, when the vast majority of our ships in the Navy and Merchant Service were coal-burners, and when America was a neutral or an ally, what, it may be asked, is the position today when the Navy has expelled coal from its vessels and the Merchant Marine is feverishly engaged in the same pursuit ?

About 2 per cent. only of the oil supplies of the world are to be found in the British Empire, and 84 per cent. of the world's oil is possessed by America. The oil that England commands is for the most part controlled financially, and even so for the most part by cosmopolitans. Control in peace may be financial with impunity, but in war it must be

physical. We may have financial control of everything in the world, but when it comes to war we may find that we have not control of anything. The substitution of foreign oil for British coal as the life-blood of English sea-power, and progressively of industrial enterprise, has immeasurably added to the responsibilities of the Navy, and thus to the size of the Navy it is imperative to maintain. Indeed, our complete dependence today on oil, and thus upon foreign nations, and more particularly America, is even a graver source of weakness than is the lamentable and growing deficiency of our home-grown food supply. We can at least defend our sea-borne food if we can move the propellers of our ships, and in emergency, or permanently by a great reduction in taxation, we can greatly expand its production, but we cannot carry or defend our food or our small remaining oil supplies if America places an embargo on our fuel from North and South America.

Any vague hope that a ready-use storage of oil in this country will meet such a situation in the event of a hostile, or even unfriendly, America is founded upon a misapprehension. The late Admiral Sir Edwin Slade, who, if anyone, was in a position to know the oil situation, was gravely alarmed at our strategical helplessness so long ago as 1926. He estimated that we might require as much as 50,000,000 tons of oil a year in the unhappy event of war. Without oil the Air Force quietly disappears and the Army, since the mechanisation craze and consequent grave reduction in personnel, must be

for the most part immobilised, and our industries crippled.

Such a position for an island country is sufficiently serious to stir into action any man who can grasp realities. Does not such a position place our friends in America in a position to dictate our naval policy, and indeed forcibly to keep, or to break, the peace of the world, for all countries, except America, are now dependent on foreigners for the movement of their ships? Here is a bondage indeed for the necessarily greatest sea-power! No words, no Kellogg Pact, no sentiment, no sophistry can alter the indisputable fact of our present bondage. Our efforts for friendship, and therefore for peace in years to come, our present peace-talks and conferences, are based upon a fatal weakness and not upon strength, and they thus lack that sincerity which freedom and strength can alone insure.

Those who, from sheer necessity, pooh-pooh our bondage to America and cosmopolitan Jews will doubtless point to Persia and Irak as providing a satisfactory and adequate source of supply in case of emergency. It is true that we have expended fabulous sums of money in order to obtain financial control of oil in this part of the world. It is also true that we have been engaged, like America and France, in ceaseless little wars on behalf of "the Oil Interests" since 1918. It is true that through the mouth of the chief British spokesman for the League of Nations that august body recently excused itself, by wireless, from tampering with these little con-

cession wars, fought largely in the interests of greed and oil, and not for a great cause of Liberty. All this may be, and indeed is, true, but it does not alter the fact that a handful of those Arabs, whom we have systematically persecuted with bombs from on high, could put our Asiatic oil supplies out of action in a moment by destroying the pipe-lines.

Now to whom does the nation owe its dangerous dependency, and at whose door must be laid the necessity for these concession wars which in no way brighten England's escutcheon? To the late Lord Fisher more than any man. Lord Fisher, in close collusion with Mr. Winston Churchill and Mr. Marcus Samuel, set out in his proverbially thorough manner to expel British coal from the seas. He decided that the time was ripe for an "Oil Age," and that settled the matter. Writing on November 22nd, 1911, to Sir Marcus Samuel, as this private gentleman had by then become, he said: "What I am driving at is oil alone for fuel." It is a simple fact of history that Mr. Marcus Samuel's steady climb through the peerage to a viscountcy in 1925 synchronised at each new step of ennoblement with England's descent from freedom into a bondage that is now well-nigh complete.

It is not suggested for one moment that Lord Fisher or Mr. Churchill were moved by any but the highest motives of patriotism. Both these great men will always stand out among England's greatest lovers. Indeed, Mr. Winston Churchill's enthusiasm, caught from Lord Fisher, for the expulsion of

British coal from the sea, in favour of foreign oil, had become so ecstatic that he advocated our present bondage, in his characteristic rhetoric, for the Glory of God as well as of his country. Writing to Lord Fisher on June 11th, 1912, he said: "Further, 'step by step' is a valuable precept. When you have solved the riddle, you will find a very hushed attentive audience. But the riddle will not be solved unless you are willing—for the Glory of God—to expend yourself upon its toils." The attentive audience, and activity, in England's coal-fields is now truly "hushed." No, it was judgment and not devotion that they both lacked. Both were victims of the fascination of material and a passion for innovation for its own sake, continued and indeed enhanced today in Lord Fisher's intellectual heirs. The last knot of speed that can be squeezed into our post-war ships is rated as of higher importance than political and strategical freedom, economic health, financial stability, and the welfare of a million loyal and patriotic miners.

It is true that Lord Fisher vaguely appreciated the extraordinary danger of the oil policy which he advocated, and which Mr. Churchill, by every effort of his unbounded and unreflecting enthusiasm, forced upon the nation; but in 1911 these zealous materialists were as confident in the power of "research" to convert our coal into oil as the Navy and the country are confident in 1930. It is on record that Lord Fisher believed that with a little "research" and expansion of our municipal gas

plants we could at any time obtain 2,000,000 tons of oil from coal. In 1919, however, Lord Fisher seems vaguely to have appreciated that the conversion of England's coal into oil was mysteriously hanging fire, and in his Memories he records that he begged his countrymen to take heed of Sir Charles Parsons, F.R.S., who, as President of the British Association, proposed *to dig a twelve-mile hole into the earth "to get hold of power."* Yet, after the expenditure of countless millions of the taxpayer's money on "research" and experiment we have not advanced one step from the position of 1911—nineteen years ago. The popular belief in the future conversion of our coal into a river of oil is the sheet anchor of a large branch of organised State-salaried "science," and of the oil industry, which encourages the myth with its tongue in its cheek, while this credulity is the despair of the unfortunate coal-owners, and is already proving the ruin of over-credulous shareholders in these schemes. Owing to the inevitable and exasperating "patience" of salaried professors, and to confidence derived from the assurances of interested parties, the Navy, and Governments as they come and go, put off the inconvenient day when they must grasp their nettle firmly and disentangle their countrymen from this oily octopus.

The author confesses himself to be in bewilderment at the naval attitude on this vital question. The argument, which he has heard a score of times from the highest authorities now serving on the Active List, runs thus:

"We, of course, are well aware of the grave strategical weakness of dependence on oil, and we regret the economic breakdown of the coal industry which we can do nothing to mitigate. We believe, however, that the scientists in the near future will extract all the oil we require from our own coal resources, and we must be patient a little longer and intensify research. Our ground for believing in the economic conversion of coal into oil is at the word of the scientists themselves. Who should know better? In the meantime, and pending the gush of oil from our modernist Moses, the necessity of a speed in our modern cruisers, destroyers and battleships, in no way inferior to any possible rival, outweighs incomparably the *strategical* weakness of dependence on foreign oil. Though admittedly our Navy cannot move a propeller in war without a vast and sustained supply of oil, extreme speeds cannot be foregone in these progressive days. To guard against the danger of interference with our sea-borne supplies we must greatly increase the number of high-speed cruisers to defend their own bellies, as well as the capacious stomachs of the Fleet, the Air Force, the Army and the Merchant Marine, from oil starvation."

At this stage the author objects that the greater the Navy the greater the oil requirements, and the greater therefore the hold of foreigners on our freedom of policy in time of peace, and of action in war. He further objects that it is at its *source*, rather than on the high seas, that it will be cut off, and

that the provision of additional cruiser programmes for defence of oil as well as food is waste of money. He objects that the argument has landed the oil enthusiasts in a perfectly vicious circle of apology. At which stage the argument ends in laughter and an accusation of " pessimism."

Let us, however, accept the professors and scientists at their own valuation. Let us bear patiently with the patience of this nineteen-year-old research enterprise. Let us accept cheerfully, and with a good grace, the collapse of the coal industry and our present strategical and political dependency on foreign nations. Let us, in fact, be " optimists " and " progressives " after Mr. Garvin's own heart. What of the technical aspect of oil as the Navy's fuel? Is oil in reality, *and on balance*, superior to coal? That oil has certain important advantages over coal is clearly true.

It is maintained, and rightly, that on the future reduced tonnages we have now mercifully to contemplate, a very much greater horse-power can be given to the vessel burning oil than is possible in a vessel of similar tonnage burning coal. The reason for this is, of course, that the space required for oil for a similar radius of action is considerably less. Oil-burning boiler-rooms can also be somewhat smaller. Thus, with the use of coal, on an identical tonnage, speed or radius of action have to be sacrificed. Again, oil is more simply fed to the furnace when fuel begins to get low, and with a similar horse-power fewer stokers are required for oil than

for coal. This is clearly true, and no one denies it, accounting as it does in large measure for the growing unemployment at sea.

Yet again, oil is more easily handled and the labour and "dirt" of coaling ship is avoided. During long periods at sea, especially at high speeds, with the use of oil continual boiler cleaning and coal-trimming is not required, thus resting the personnel.

The author had understood that full speed from slow or moderate speed was a much quicker process with oil than with coal, but he has recently had his belief in this advantage of oil shaken by a very distinguished Engineer Admiral who proudly claimed from experience with both that with a perfectly trained boiler-room personnel, steam could be raised as quickly with coal. How far this is true the author is not in a position to say.

These advantages exhaust, so far as can be discovered, the advantages claimed for oil, and all these advantages, with the exception of a reduced personnel and a saving of exertion, are advantages only so long as the excessive competitive horse-powers now installed in our ships are regarded as strategically and tactically necessary.

The fighting values of these great horse-powers, beloved by modern scientists and anathema to true engineers, have been shown, and proved by experience, to be of little if any fighting value, though introducing perforce into the post-war cruisers and destroyers of all nations a defencelessness and lack

of fighting strength which reduces them to a status little better than that of armed merchantmen.

We are, indeed, witnesses in the Navy of an echo of that competitive speed craze which is so dangerously, and always uneconomically, afflicting the world today, at sea in the Merchant Marine and ashore. Apart however from the strategical, tactical and fighting disabilities of fabulous horse-power (always inadequately reflected in speed), there are certain very definite advantages in coal-fired ships. Coal, even at its present high price, is cheaper in most parts of the world than oil. That is to say, the coal needed to steam a given distance costs less than the oil required for a similar distance. In construction and maintenance coal-bunkers are considerably cheaper and sounder than oil tanks, and the vessel with bunkers is stronger than the one with oil tanks. Perpetual riveting to stop leaks, and ceaseless cleaning and painting of fuel tanks are avoided. The risk of fire is greatly reduced. Furthermore, coal is a valuable source of defence against gun-fire and under-water damage. Coaling ship and stoking are admittedly an exertion, but is this seriously a disadvantage at the present time? Both these activities can provide the modern navy of steam with a magnificent offset to the loss of training in skill, determination and hardihood which the passing of sail entailed. There is no substitute for coaling and stoking in the Navy today which provides so admirable a means of sorting sheep from goats and for providing a means of selecting

our future petty officers and leading seamen and stokers.

From the strategical aspect, coal can be *dumped* all over the world in veritable mountains, whereas oil storage requires enormous provision of tanks, pipe-lines and plant, the cost of which is a large and menacing item in naval funds. The tanks, moreover, in many cases need defence where coal dumps would need none.

From the economic aspect, and disregarding the overshadowing disaster of the ruin of the coal industry, colliers can, and do, make return voyages with general cargoes, whereas tankers spend half their lives in ballast, except for an occasional return voyage with a cargo of molasses. Indeed, it is difficult to compute the serious loss to shipowners which this vast unremunerative tonnage involves. Though more stokers, for a given horse-power, are required in coal-burning vessels, this disadvantage, if indeed it is a disadvantage, progressively disappears with the reduction of horse-power until a point is reached at which a moderate horse-power will require the same number of stokers for coal as an excessive horse-power requires when oil is employed.

In short, on technical grounds the sole argument for the use of oil is insistence on the necessity of extravagant horse-powers to obtain a few extra knots, which will only in fact materialise under very favourable conditions of sea and cleanliness of the ship's bottom. We know as a fact that speed will not enable an unwilling high speed opponent to be

brought to action, and experience in the late war confirms what unaided reason should tell us. Excessive horse-power admittedly reduces to vanishing point the fighting qualities of a ship of limited tonnage, and yet, despite all these demonstrable facts, the speed craze reigns supreme and coal is forced to pay the penalty.

It may be interesting to give one or two examples of the vast growth in horse-powers and the relatively slight reward in speed.

The *St. George*, an old armoured cruiser of 7,700 tons, built perhaps forty-five years ago, burning coal and fitted with old obsolete Scotch boilers, had a horse-power of 10,000, and on this trifling power could maintain a speed of 19 knots.

Old coal-burning destroyers of a generation ago, fitted with reciprocating engines, obtained speeds of 35 knots, faster, in fact, than the real speed, as opposed to paper speeds, of modern destroyers with 29,000 h.p. burning oil.

The old River Class destroyers of 550 tons, with a gun armament scarcely inferior to that of the latest destroyer, the *Ambuscade*, burning coal and with a horse-power of 7,000, obtained and maintained a speed of 25 knots. They cost approximately £80,000 apiece. The *Ambuscade*, mounting the trifling gun armament of four 4·7-inch guns, burning oil, with a horse-power of 36,000, and costing little short of half a million sterling, is *credited* with a speed on trial of 37 knots, a speed which all destroyer officers know is in practice,

under average sea-going conditions, a fantastic unreality.

Rocket, a destroyer which the author commanded, was credited with a speed of 33 knots and her horse-power was 28,000. In many full-power trials this vessel obtained a maximum speed of 30 knots with the full 28,000 h.p. developed. The most significant fact of all was, however, that this maximum speed was always reached at 19,000 h.p., and the remaining 9,000 h.p. was expended on propeller "slip."

The battle-cruiser *Hood* has the great tonnage of 42,000 tons to accommodate eight 15-inch guns, and a horse-power of no less than 140,000, of which horse-power thousands are utterly wasted, and which at extreme power gives the vessel a speed but little superior to that of *Renown* with a horse-power of 112,000, which, in its turn again, is largely unabsorbed by her lesser tonnage.

Forty-five years ago we obtained 20 knots in a coal-burning vessel of 7,700 tons, fitted with old Scotch boilers and with 10,000 h.p. Does not this afford food for reflection? Similarly, we obtained 25 knots in a coal-burning destroyer with 7,000 h.p., whereas we now obtain, under average sea conditions, a speed little in excess of 30 knots with 36,000 h.p. oil-burning boilers. In concluding these examples of the vast growth of power with an utterly disproportionate growth in speeds, it is of interest to contrast the last of our coal-burning battleships with oil-burners.

The *Iron Duke* is a coal-burning battleship of

25,000 tons, mounting a main armament of ten 13·5-inch guns. Her horse-power is 29,000. The *Royal Oak* is an oil-burning battleship of 25,750 tons, mounting a main armament of eight 15-inch guns. Her horse-power is 40,000. Thus with the negligible additional tonnage of 750 tons and an increased horse-power of no loss than 11,000 this oil-burning vessel carries a much-reduced armament and has in theory, *though not in practice*, an additional speed of 1 knot. The Iron Duke Class are widely regarded as still our finest battleships, and yet these splendid coal-burners* are to be scrapped because they were completed a year before the *Royal Oak*.

It is also instructive to compare the performance of the battleship, *Royal Oak*, with that of the pre-Dreadnought, coal-burning, reciprocating engined battleship *Implacable*. Fifteen thousand horse-power installed in a 15,000-ton vessel gave a speed of 18½ knots, whereas 40,000 h.p. in a 25,750-ton ship gives a normal speed of 21 knots only. It seems, indeed, that for the battleship 1 h.p. per ton is about the maximum power that can economically, and therefore advantageously, be employed.

Turning to one striking example in the Merchant Service we find the twenty-three-year-old *Mauretania*, burning *coal* until 1919, falling short of the performance of *Bremen* and *Europa* by a speed that is almost negligible, apart from the mere question of a somewhat questionable "prestige." If we compare the horse-power and cost of these vessels there

* Converted to burn oil a few months before scrapping.

can be little question as to which is the sounder economic proposition. By this post-war fight for international "records" we are all on the high-road to economic breakdown.

Now the Cunard Company proposes to recover the "record" by building vessels of 73,000 tons and 200,000 h.p., each vessel costing, it is said, £4,500,000. New dredging and docking schemes are foreshadowed, and State assistance is complacently invited, an opening eagerly seized by a Government pledged to destroy private enterprise by State meddling and subsequent State ownership.

In concluding this brief technical examination of the relative value of coal and oil as a source of power the author would reiterate that if the technical case against coal were infinitely stronger than in reality it is, the purely technical aspect fades into insignificance when viewed in the light of the strategical, political and economic servitude that the substitution of oil for coal at sea, in the Merchant Marine as well as in the Navy, involves. To Lord Fisher's idea of sea-power and material we are indebted for our bondage to foreign nations. Freedom from this bondage in the coming years will be a symbol and a sign of the collapse of those doctrines of sea-power for which Lord Fisher is responsible. There is today, as there always has been, one alternative only to the tradition of the Materialists, and that alternative is the tradition of Nelson and our forefathers who were the exponents and master executants of the Blue Water School of the sea, and in the exercise of sea-power they were free men.

CHAPTER IX

A CONCLUSION TO CRITICISM

IN examining post-war naval policy two courses were open to the author. He might have shown at the outset that certain doctrines inspire present naval thought, and have proceeded then to show that naval policy in these post-war years has been ruthlessly and conscientiously logical. His alternative was to set down bluntly at the outset the outstanding features of naval policy, both material and administrative, and at the conclusion to show that the policy that has been criticised is the perfectly logical and natural outcome of a definite philosophy of war.

The latter alternative has been chosen, and here at once the author would apologise for obtruding very shortly certain abstract philosophical reflections in a book that deals with the very concrete question of naval policy, construction and weapons. He has done so only because the roots of particular actions are always to be found embedded in a general, if unconfessed, attitude of mind. If we wish to account for the present actions of men, or to forecast their future action or policy, it is only possible to do so by understanding the philosophical outlook of which action is the natural and inevitable fruit. A tree is *known* by the fruit and fruit is *foreseen* from the tree.

What then is that philosophy which, in this admittedly feverish and in many respects unsatisfactory generation now drawing to a close, informs and inspires all public action ashore as well as afloat? Surely it is just this: Until relatively yesterday we lived, in secular affairs, according to the Gospel of Tradition, the Gospel of the Greeks and Romans, the Gospel of our forefathers, and thus of civilisation itself. Today we live and *act* according to the Gospel of Darwin, in mechanical, secular and religious matters. Until yesterday the world acknowledged *absolute* standards as the sallying-point, so to speak, of action and *true* progress, which is not to imply that the world was always wise in the past, for fallible human beings will always err, no matter how clear, true, and therefore absolute and final accepted standards may be. Today, on the other hand, the absolute and unchanging nature of Truth, in all its infinite aspects, is discredited by the evolutionary conception, with the result that the possibility of progress, whether of the physical man himself, or of his policies and inventions, is believed to be illimitable, though incapable of definition, and without *finality*. We are living in a world of philosophical relativity, a world which openly and quite frankly denies that a principle, for example, whether good or bad, is unalterable. We are, in fact, without standards. Finality in any *particular* means of achieving an object is laughed out of court because progress in a particular machine is conceived to be as possible and as assured as is the progress and improvement

of living species believed, humorously enough, to be proceeding steadily and automatically through eternity.

Not long since an important officer at the Admiralty, to be precise the Head of the Tactical Section, and a friend of the author's, was discussing certain aspects of a proposed policy which the author was criticising. This keen and able officer suddenly sprang from his chair, as did Archimedes from his bath, exclaiming in good round naval terms Ευρεκα. He charged the author with the prehistoric belief that there is finality in anything. When he was informed that it was naturally assumed that there *should* be finality in particular principles and in particular machinery, and that the lack of finality was the direct cause of the growing cost and mechanical chaos of the fleet and the great industries, the Head of the Tactical Section, after easing his feelings in a healthy and hearty manner, informed the author that, without a doubt, he was past praying for, as he frankly confessed was the case. Now this able and distinguished officer, who will perhaps read these remarks, was undoubtedly voicing the general view of the Navy with regard to the nature and unlimited possibilities of mechanical progress, whereas the author was, though to a considerably less extent now, a pelican in the wilderness.

To what conclusions does a real and lively belief in what may be termed " evolutionary mechanics " lead ? Surely to these: Types of ship, particular weapons, forms of propulsion, strategical principles,

are never perfect or governed by absolute laws. With the universal enthronement of evolution as a creed such a view is not merely inevitable but most simply logical. The idea of *creation*, which implies finality, gives place to the idea of *evolving*, a process which instantly opens the door to an army of " research workers " eager for salaries and a life-long career. The passion for " research," which as a matter of experience rapidly changes into a taste for projecting, as Swift so well knew, quickly infects, as it has now almost entirely infected, naval officers, with a result that no sooner is the idea of a new weapon or ship clothed with matter, than some new and " progressive " idea, soon to be clothed, takes its place. Thus a gun, a torpedo or an aeroplane is never quite a gun, a torpedo or an aeroplane any more than a man, according to Darwin and Modernists, is ever quite a man, a bird a bird, or a beast a beast.

It is not, of course, by the evolutionary cast of mind that new inventions are conceived, and great and startling discoveries are made, discoveries which *supersede* previous means of achieving an old object, or of giving birth to new ones. In the present atmosphere of research sailing ships would not have been replaced by steamships. Rather would sailing ships have been evolved into sailing juggernauts, just as Lord Fisher's little " Blimps " of war days have been evolved by Commander Burney, at public expense, into that astounding *Wellsian* implement of commerce, R 100. There is another characteristic in

those who, rightly or wrongly, have substituted a Relative for an Absolute philosophy—the Modernist for the Traditional. Any change is believed to be for the better, or if obviously not better, *inevitable* in an evolving world—a world on the move. Thus a sort of fatalism inspires the world today in the physical as in the political, economic and religious spheres. Freewill, the mastery of material and fate by the mind, is frankly suspect, and we are all coming to regard ourselves, our machines and our politics, as mere cogs on the wheel of time, rungs in a ladder leading to—where?

In the progressive decline of the belief in the potentially absolute nature of individual freewill, one of the most striking adjuncts of the evolutionary philosophy, we find a growing mistrust of individual judgment and the shirking of individual responsibility. Opinion is confounded with fact, and speculation does duty for knowledge. In such an atmosphere the committee spirit—the staff spirit—thrives, and the average of a lot of opinions is rated higher than the knowledge of a single man, no matter how unanswerably the individual may prove his knowledge to be a fact. The reason for this state of affairs seems to be this. Truth, it is argued, is many-sided, has many "facets," to use the current term, and moreover is not absolute in itself. Therefore any man who is clear and definite is suspected of being a "fanatic." Hence, in the Navy particularly, a man who says that such and such a thing is so is spoken of, invariably, as an extremist. Thus if the

author states, and maintains, that a certain implement is a poker, whereas another officer says it is a shovel, the difference of opinion is in all probability settled in the Board Room by the official pronouncement, subsequently to be implemented in policy, that the object in dispute is in reality a poker-shovel. In short, " splitting the difference " is to be regarded as the hall-mark of wisdom and of sober and judicious action, thus revealing the belief that Truth is relative and not absolute.

The fact, of course, is that Truth *is* extreme, often uncomfortably so if we depart too far from it. It is undoubtedly the statement of an extremist to say that giant airships are commercially useless, or that a *great* commercial future for aeroplanes is a myth. The statement is extreme, however, only in the sense that it is extremely true. Curiously enough in these curious days, a moderate statement couched in strong and unequivocal language is often treated as extreme, whereas an extreme view, if expressed in sufficiently vacillating, hedging, apologetic, prophetic or pompous terms, is often regarded as moderate. Now assuming, as the author naturally does, that the philosophy at the root of post-war naval policy is of the essentially evolutionary cast, in line, that is to say, with the philosophy that now admittedly inspires the bulk of the activities of very modern 'civilisation,' what should we expect to find as the distinguishing features of naval construction, weapons, methods of propulsion, administration and training?

Shall we not find our ships assuming unusual forms, and housing an ever-growing and ever-changing variety of instruments and devices? Will not the very nature of our ships undergo a transformation in harmony with strategical principles conceived, in their turn, to be changing—evolving? May we not expect to find a growth in sheer weight and size, that sure symptom of development beyond the saturation point of efficiency? Refinement and reduction in bulk used to be regarded as the goal and the test of ultimate perfection in any particular instrument or machine. But today the ultimate is openly disputed.

May we not reasonably and logically expect to find weapons, whether guns, torpedoes or aircraft, growing in size, intricacy, and thus in cost? Is it not likely, indeed certain, that the evolution of the weapon will render it unfit for use in orthodox strategy and tactics, thus making it necessary to evolve a new strategy—a new military *environment*—to allow the new weapon to be used at all? A reversal, it will be noted, of the alleged working of the law of evolution.

In ship propulsion we may look for a steady growth in horse-power, and thus again in weight. Since weight, however, must be kept within bounds, will not a tendency develop to evolve super-heat and super-pressures, in their turn demanding some new metal to withstand the enormous strain and temperatures involved? As with steam, so with internal combustion engines, we may expect to find never-

ceasing experiment with the Diesel engine and the same growth in weight and power, which cannot however be utilised without expanding its " host." Such a philosophy as has been depicted will not be reflected in material only. In the administrative and executive spheres we shall most assuredly see a great growth of staffs, committees and sub-committees, because individualism is as alien to the evolutionary cast of mind as are collectivism and divided responsibility to those of the fundamentally classical and traditional mentality. Extreme specialism is both a cause and an effect of the prevailing doctrines. It is specialism that generates the multiplicity and flux of weapons, and of " gadgets " inseparable from the specialist mind, and specialism which is again created automatically to deal with the ever-changing ramifications to which specialism gave rise.

The cost of a Navy governed by the evolutionary creed must of necessity " evolve " with the evolution of species, so to speak, for it is a matter of common observation that everything grows bigger and more weighty when human beings set about evolving in an objective sense, giving, that is to say, the verb to evolve an *active* instead of a *passive* meaning. Herein, perhaps, lies one of the most powerful arguments against the truth of the Darwinian hypothesis, for if " evolution " is a natural law in the universe, it has worked diametrically opposite to the manner in which we see man-handled evolution working before our eyes. Prehistoric beasts were mammoths, and the reduction of size and weight with an in-

crease in efficiency is postulated by science as the aim of evolution, if indeed it is reasonable to speak of "an aim" in a mechanical process.

If, then, the evolutionary philosophy inspires the Navy today, may not the author claim that naval officers, so far from being blamed for the alarming growth of their ships and weapons, and for the rising cost of a numerically shrinking Navy, should be praised by all those to whom the evolutionary philosophy is common? Is it not a strange coincidence that the Navy that may be expected to develop out of a certain philosophy is precisely the Navy that we find in existence? If naval officers and laymen are disposed to question the soundness of our post-war policy, will they not perforce have to question the philosophy from which it has sprung and of which Wells, Fisher and Darwin were prophet, priest and king?

PART III

A NEW NAVY
THE NAVY OF TOMORROW

CHAPTER X

THE FOUNDATIONS OF STRATEGY

IN past chapters of this book the author has been guilty of an orgy of destructive criticism. Such criticism is always, and quite rightly, unpopular, and is, furthermore, not infrequently considered to be easy. If, however, the destructive criticism of ideas, almost universally accepted, is sound, it is surely only a less pleasant form of constructive criticism, provided always that the foundations of the edifice criticised are true. We all, and certainly not least the author himself, believe the foundations of the Navy to be the same as in the centuries gone by, and therefore flawless, broadbased as they are upon the character and fighting qualities of British seamen. If, however, Lord Fisher's strategical and material edifice is cracked and full of flaws, it is essential to remove it before we can rebuild, on the same old foundation of character and sound doctrine, a new Navy of steam, armour and powerful guns that will continue through coming generations the mission for which it exists, a mission which the old Navy of sail so effectively, chivalrously, humanely and inexpensively performed.

The author need hardly say that his personal pleasure in this latter part of his book is a measure of his strong distaste in the writing of the former

part. Creation, however imperfect, is pleasant to all of us, and destruction hateful, even when necessary, to all but the very few who enjoy the dirty tub of Diogenes. It is the author's whole case that principles do not evolve but stand fast for ever. Just as persons and policies of all eras must continue to conform to first principles of conduct and economics if the country is to maintain its greatness, so must weapons and material conform to that strategy which is compounded of principles which never change. First principles, it has been well said, prove and are not proved. If this is so, it seems worth while to consider shortly and clearly those unchanging strategical principles of sea-power which must remain for all time the dictator, and not the servant, of weapons and material, past, present or to come. Only thus can we insure to England her continuing position of decent authority, never dictatorship, in the councils of an imperfect and therefore quarrelsome world.

For what purposes, in the first place, does the Royal Navy exist? What are its duties in order of importance? Surely just these:

(*a*) Defence of our island against aggression, which implies, primarily, a guarantee of the food and oil supply, so long as oil remains our fuel.

(*b*) Defence of the outlying Dominions and Dependencies, which implies, primarily, the prevention of ultimate foreign usurpation.

(*c*) Prevention of piracy and slavery and the maintenance of the freedom and security of the seas

for all men of all nations in times of peace, and the succour of all in distress by shipwreck or misadventure.

(*d*) Maintenance of those friendly and courteous relationships between nations which the Royal Navy, like foreign Navies, insures.

To enable us adequately to perform these duties we must maintain sufficient maritime power to intervene effectually in international affairs, a power which implies the means of effective interference with the supplies essential for the indefinite continuance of resistance, in fact the power to institute blockade; the power to dispatch, safeguard and supply military expeditions of our own; and the power to prevent the movement or reinforcement of an enemy's military forces by sea, while securing the seas for expeditions of our own.

These appear to be the purposes for which the Navy exists and the means by which these purposes can alone be attained, and they may allegorically be summed up by likening the Navy to the strong and masterful, but friendly, right hand of England in a glove of the softest and gentlest velvet. Such a view of the Navy may seem Utopian, but in our sea-power we can pride ourselves on having achieved one, if only one, of the many Utopias devised by man because these functions have been exercised for centuries successfully, and with trifling bloodshed, in the spirit of true, because militant, Christianity.

If, then, the foregoing are the purposes for which the Navy exists, what are the outstanding features

of that sound strategy, in the event of war, which will enable these functions to be most perfectly, humanely and economically exploited? What, it may further be asked, is the exact meaning that is to be attached to the rather loosely used term strategy? How is it to be defined? How is it to be clearly differentiated from tactics?

Taking the definitions first, we surely mean by sound strategy just this:

Sound strategy is the imposition upon an opponent of a certain course of action which compels him to act, and to limit his activities, within certain definite bounds prescribed partly by natural forces and partly by the will of the opposing strategist, who thus wields what is known as the strategical initiative.

Sound tactics, on the other hand, is the efficient handling of the situations—the battles—that arise out of the necessities of the overruling strategical situation.

Strategy is thus purely a matter of the mind, necessitating in the strategist, if there be one, no personal qualities of physical fearlessness, quick judgment, leadership or popularity. Cold and calculating reason alone is required. Indeed, sound strategical thought may be impersonal, as before the advent of Lord Fisher it was, being in truth a traditional habit of thought, built up by centuries of experience and handed on from generation to generation.

The tactician, on the other hand, requires all those

virtues with which the strategist can dispense, the strategical mind being in no way essential to him, and indeed seldom to be found in company with the other warm and human virtues and sympathies which mark the great tactician. The tactician works unconsciously within a doctrine—a philosophy of war—which is native to him though possibly outside of, and in any case in no need of, his powers of analysis. In Lord St. Vincent, the great administrator, and Nelson, the heroic and unrivalled sea-commander, we have the supreme climax of a brilliant tactician consummating the plans of a sound strategist.

Thus it is that England never has lacked, and never will lack, great sea-commanders, though in the past generation she has been without that supreme necessity, *a sound sea doctrine*, in the absence of which tactics and material are shorn of the greater part of their effectiveness. As already emphasised in the definition of strategy, there are certain natural limitations which circumscribe in many directions the free use of the opponent's apparent fighting resources, and it is of the first importance to gauge accurately these natural strategical limitations; to insure that they are brought fully into play; to have the self-reliance to rely upon their efficacy in circumscribing enemy action; and to cultivate self-confidence in avoiding any undue output of effort or material to reinforce them. Thus alone can economy of effort be achieved, and the full striking or defensive power be developed at the decisive points.

Geographical features—the lack of safe anchorages or fuelling bases—the geographical position and attitude of a neutral—the presence or absence of harbours of refuge—dominant weather conditions, affecting small craft, in certain parts of the world—these and other considerations will circumscribe the oceanic areas within which certain nations will be compelled to restrict their naval activities, and they will give a clear guide in deciding the size and composition of the fleet that will best and most economically fulfil the needs of any particular nation.

In the case of Great Britain alone is naval action possible, and potentially necessary, in all the Seven Seas of the world, a lack of restriction which points as clearly, as will later be shown, to the nature of the fleet that England requires as do natural strategical limitations indicate the nature of the fleets indispensable to those nations who are subject to such restrictions. Such considerations alone are sufficient to throttle at birth any plan for standardising, by international agreement, the tonnage and other particular features of individual ships, or of rationing tonnage on a *category* basis. Standardised " yard sticks " are thus in the nature of a frivolity !

One natural strategical limitation transcending all others in importance has, however, been left out of account in order that it may be discussed separately. What sea-communications, if any, are absolutely vital to a possible opponent? Which are of great if not of decisive importance? And which are merely useful and subsidiary? Here we reach the

point at which active strategical initiative should impinge upon an opponent's natural strategical limitations, the point, in fact, at which the whole force of our active intervention should be launched, with all that concentrated might which has been husbanded and brought to its maximum by economy or absence of effort in unimportant directions, and by reliance upon natural forces to circumscribe the activity of an opponent within a narrow field.

It is a truism that the isolation of an opponent from outside sources of aid is the corner-stone of all sound strategy, whether military or naval, and it is only by keeping our minds concentrated on this axiom, and by constructing and training our Navy with this object in view, that we can maintain our sea-power as a sure shield, *and at a tolerable cost.* This axiom of strategy supplies us with a simple answer to the question, often now posed and variously answered, "What should be the composition and mission of the new Navy?" Surely the answer, in a few words, is this:

The Navy should be planned, constructed, and trained as a balanced whole to render it an instrument which can obtain decisive and overwhelming victory over the enemy's main fleet when the fleets engage, the decisive point being in the future, as in the past, opposite the guns of the enemy's battle fleet.

Naval strategy should consist of a single-minded determination ultimately to force action on the opponent, whether he wishes it or not, and to make such action, when joined, decisive.

Before proceeding to show how these two ideals can be compassed, it seems desirable to meet in advance the criticism of those naval officers who may be disposed to maintain that the author is guilty of platitudes, and that he is preaching a doctrine already enshrined in post-war policy. It may be admitted at once that the author's enunciation of doctrine should be a platitude, and that in past generations it would so have been. But times have indeed changed, even though principles have not.

It has been shown elsewhere that Lord Fisher and his intellectual heirs have been responsible for the introduction of a new doctrine alien to the great tradition of English sea-power, a doctrine which is, in effect, that the maintenance of a greatly superior fleet in being may be made the equivalent of a decisive and victorious sea battle. It is such a doctrine that manifestly holds the field today, for on no other grounds is the nature of our post-war policy and fleet comprehensible or indeed rational. It is a doctrine actively maintained by all apologists of Jutland, who remain convinced, curiously enough, that in that unhappy engagement we obtained the fruits of victory without victory.

Turning to the strategical platitude that the composition of our fleet should be planned with a single eye to the main engagement, it need only be said that it has passed into common currency that England requires a specified number of special cruisers of such and such a nature " for the defence

of the trade routes" or so many submarines and aircraft "for the local defence of the Dominions." The value of battleships is openly questioned. Indeed, it is common knowledge that ships are now advocated, and specially designed, for the *particular* purposes enumerated earlier in this chapter under (*a*) and (*b*), thus revealing the general belief that each of these *fruits* of predominant sea-power requires specialised provision, as, for example, 10,000-ton "ocean greyhounds" for the defence of the trade routes.

Thus we are confronted with two totally opposed doctrines of sea-warfare. Whereas Lord Fisher's disciples rely mainly on material, and regard the defence of trade, the defence of outlying Dominions, and the maintenance in being of a materially superior fleet as objects in themselves, the traditional school of seamen regard the fleet action as the overmastering business of the Navy, and the defence of trade, of the Empire, and the maintenance of a fleet in being as the natural fruit of a decisive sea battle which alone can guarantee and finally secure this natural harvest of victorious sea-power.

The author must apologise for labouring these matters, but the distinction between the two doctrines is dramatic when we contrast the two navies that will inevitably embody the two embattled doctrines.

Let us now consider in some detail how this decisive fleet action can be forced upon an opponent who, for various reasons, may be anxious to postpone

it, if not to avoid it altogether. The avoidance of that battle desired by the stronger Navy is a very sound, and indeed traditional, strategy for a weaker opponent, who will endeavour, by maintaining his own weaker fleet in being and thus ever threatening, to immobilise the stronger fleet, and thus prevent its dispersion for that more complete mastery of every sea, ocean and trade route which a great sea victory alone renders possible. Furthermore, he may be able, by stratagem, by force of circumstances, or by an error of judgment on his adversary's part, to catch his opponent's battle fleet divided and defeat each part in detail.

Let us, by way of an example, take a purely imaginary but practical instance of sea-power exercised thousands of miles from our main bases and dockyards. Let us consider Japan, a strong and high-spirited island sea-power off the coast of China. China is a vast neutral empire, weak militarily, but a vital source of food-supply and of material to Japan, which is not, and cannot be, self-supporting in view of its teeming population and of its lack of many modern necessities for war and peace. Other trade-routes to the East and West are valuable to Japan, but her trade with North China is alone vital, if we disregard her present dependence on Borneo oil, from which she can free herself by a return to the use of coal.

England has two strategical bases in the Far East, Singapore and Hong-Kong, situated very approximately 3,000 and 1,000 miles from the principal

Japanese harbours and bases. These bases, and more especially the former, are defended by powerful shore defences, by fleets of flying boats and by submarines against attack from the sea. It is the base at Singapore, 3,000 miles from Japan, upon which England has for years concentrated her attention, and upon which she has expended large sums on the ground, among others, that it is the strategical key to the defence of the sparsely populated continent of Australia, which Japan (by supposition) is believed to covet as an outlet for her teeming population.

With the foregoing facts clearly in mind, let us now suppose the following political situation. Japan shows a disposition to establish a position of unquestioned predominance and control on the other side of the world, and to find a rich and extensive field for the expansion of the Japanese race. Her desire for the unfettered exploitation of China is believed to be second only to her desire to hoist her flag over the vast, rich but lamentably sparsely, because urbanely, populated continent of protectionist Australia.

Let us finally suppose that Japan, in search of a seemingly innocent excuse for a quarrel, interferes in the internal affairs of China in a manner detrimental to the rights and legitimate interests of England, and of China herself, and in so flagrant a manner as to necessitate opposition. All efforts at a peaceful settlement fail and Japan declares war on England. How is England, with only a few

cruisers in these distant waters, to act under circumstances which appear, at first sight, to be as unfavourable for effective naval intervention as could well be conceived ?

England's fleet is slightly superior on paper to the fleet of Japan, but it is 12,000 miles away. Australia is known to be an object of supreme desire to Japan. It is true that England possesses her large fortified and aerially garrisoned base at Singapore, 3,000 miles from Japan, but the outward and return voyage to Japan is twice 3,000 miles, a vast, and indeed impossible, area over which to operate from a strategical base. Though this distant base has been prepared and defended at great cost for the reception of the British fleet in case of emergency, and at the cost of grave political friction, it soon becomes plain that strategically it is largely valueless, even though in peace it had seemingly provided a bulwark for the defence of Australia. The grave disabilities of this base only become apparent, however, when it is appreciated, *after the outbreak of war*, that Japan has no intention whatever of *attacking* Australia, thousands of miles to the southward, or yet Singapore, relying as she does, most naturally, on defeating or immobilising the British fleet and thus making the cession of these coveted possessions a condition of the Peace Treaty.

An appreciation of this simple matter is unfortunately only arrived at after the outbreak of war, when millions have been expended on the base at Singapore, and millions more on aircraft, sub-

marines, guns, barrages and so forth for the *local defence* of Australia, and at the expense of our main fleet. Too late it is realised that mobile ships are the real and only defence of the Australian continent, and that the base at Hong-Kong was the vital one. This appreciation of the true position is borne in upon us by the complete immunity from attack on Singapore, for the defence of which a few guns and troops were sufficient, and by the powerful assault on Hong-Kong, 1,000 miles only from our opponent's main bases and a few hundred only from Formosa.

First let us assume that Hong-Kong falls to the combined assault of our opponent's main fleet and army. A terrible, and possibly irremediable, blow is thus dealt to the British fleet now reaching the powerfully organised *distant* base at Singapore. Our opponents rapidly consolidate the defence of their newly acquired and advanced base at Hong-Kong and, declining very naturally to meet our wishes by proceeding with their weaker fleet to engage our main fleet thousands of miles from their home bases and dockyards, they leave a powerful garrison and a squadron of cruisers at Hong-Kong and withdraw their main fleet to their own waters.

What is now the position ? Japan has secured her vital trade route with North China. Her cruisers are free to harry England's trade throughout the Far East, in the Pacific, and, indeed, to close down her Eastern trade completely by the blockade of the China ports far to the north of Singapore.

England's fleet meanwhile, separated by thou-

sands of miles from her proper objective, the opposing battle fleet, is impotent to intervene effectually. England must now set about the recapture of Hong-Kong, a most difficult and indeed forlorn undertaking, depending for its success, as it must in great measure, on an alliance with China, and thus the ability to employ an expeditionary army, which will most certainly be required.

The prolonged nature and vast dimensions of the war now forced upon us, with the extreme strategical disabilities and limitations imposed upon us by our adversaries, and by our former errors of strategical judgment, may well lead to a precarious and patched-up peace which leaves the complete control of the East at the mercy of others, and possibly involves the ultimate desertion to her fate of the great continent of Australia.

Let us now assume, however, that by the extreme good fortune which miraculously attends us, aided by the stubborn resistance of the natural fortress of Hong-Kong, Japan fails to overcome it before the advent of the British fleet, which is thus enabled to anchor and fuel in its spacious harbours and friendly anchorages. The Japanese fleet, short of fuel, withdraws to its harbours out of reach of the British fleet, also short of fuel though to a less extent, which now lies at anchor in the magnificent harbours of Hong-Kong and Mirs Bay.

The first phase is over, the second phase begins. The two powerful fleets are both "in being," and within fighting range of one another. Japan must,

at all hazards, maintain uninterrupted her trade with Northern China, and England must defend Hong-Kong from isolation, dependent as it now is on provisions, fuel and stores from the Western world owing to her former neglect of a base which is now seen to be absolutely essential for strategical purposes, but which, from lack of foresight and at the dangerous dictates of sentimentalists and short-sighted "pacifists," has not been stocked with those essential requirements of a fleet which lie instead in luxurious profusion at Singapore, 1,800 miles astern.

Both fleets, it will now be seen, are resting on powerful bases within operative distance of one another, but both are subject to a dangerous weakness in the form of a vulnerable line of communication by sea. England's weakness has been largely self-imposed because it would have been possible to have her essential but modest supplies stored at Hong-Kong in advance, the requirements of the fleet being relatively a small matter. Existing docking facilities in Hong-Kong would have been adequate for smaller ships than we now possess. Japan's weakness, on the other hand, is strategically *inherent*, because she must feed and sustain a teeming population in addition to supplying the needs of her fleet.

Decisive interference with the trade between Japan and North China must now be the entire preoccupation of the British fleet, and for one dominating reason. Interference with Japan's vital communications is not in itself the object of British

strategy. Starvation is not our object. It is the *means* to an end, that end being the absolute compulsion of our opponent to accept irretrievable defeat by blockade or to face a fleet action, complete victory in which will alone enable the winning side to disperse its main fleet and its cruisers for the thorough suppression of its opponent's activities at sea: if necessary, the institution of close blockade of every port, and the obtaining of security from the slightest threat of the victor's own communications.

Action opens by cruiser activity on both sides, our own cruiser activity being supported by the near presence of the British battle fleet which has been carefully designed to keep the sea for extended periods at the ideal strategical point. Convoy as a defence against British cruiser action can only ultimately be successful in the absence of imminent threat from the British main fleet. The engagement of British armoured cruisers by swifter Japanese cruisers can again only be successful, or even consistently attempted in the absence of support or threat by the British fleet, disregarding altogether the fighting weakness of very swift cruisers in action with armoured cruisers. Thus it will be seen that sheer necessity will eventually force a test of strength between the main fleets, even though the materially less powerful fleet of Japan is anxious to substitute for a fleet action a guerilla war on British commerce generally, by submarines or other means. Decisive action in the example cited can thus be forced on our opponent if we steam our fleet to the strategic

danger-point *and remain there* in support of our cruiser attack on Japan's vital artery. Should Japan, by a sustained cruiser attack supported by her battle fleet on the communications of our Base, reverse the rôles, it will be seen that decisive action can again be forced, but this time by Japan, who thus seizes the strategical initiative. In either case action is offered, and such an offer will be welcomed and accepted by the British fleet and made decisive.

Let us suppose in either case that action has been joined and victory achieved, let us say by Japan. The war, under modern conditions, is over. The victorious fleet can now isolate Hong-Kong, throttle our trade throughout the East, disregard Singapore, and continue her trade throughout the entire East and in the Pacific. There is no need to attack Australia, defended locally at enormous cost, nor yet Singapore, 3,000 miles away, upon which we had expended such great sums and so much energy and thought. At sea we have become impotent in the presence of a victorious fleet, and the cession, or desertion, of Australia and Singapore can be achieved by signature, and without the shedding of a drop of blood.

If the victory goes to ourselves, on the other hand, our trade with the East is secured, our possessions are safeguarded, Japanese trade is paralysed, and the great bulk of our effort and expenditure on local defence will be found to have been totally unnecessary.

The author is not so ignorant or foolish as to

suggest that any future sea war is likely to be strategically so clear-cut as in the imaginary—the very imaginary—case he has examined. In most cases in the future, as in the past, our opponents will not be vitally dependent upon a single and vulnerable line of communications for essential supplies. Indeed, European nations and America are definitely not so dependent. No nation, with the exceptions of England and Japan, can be *starved* into submission, a fact which satisfactorily disposes of a plausible argument of sentimentalists and aerial " strategists " against the employment by England or Japan of blockade on the grounds that blockade is more cruel and indefensible than the indiscriminate attack on civilians by aerial bombs.

In the great majority of cases England's sea-power will be required in the future, as in the past, to secure her own vital communications, while at the same time bringing a cumulative pressure to bear on the supplies of war material, and on the accustomed luxuries and economic health of her opponent. On the more strictly military side her sea-power will be needed to deny to her opponents, and to insure for ourselves, the power of moving troops and supplies to a strategic danger-point, as in the historic wars of liberty in past centuries. Thus, soon or late in the campaign, the time depending largely upon the relative fighting strength and spirit of the main fleets, a situation will develop in which action must be hazarded by the weaker or less high-spirited Sea-Power if it is to avoid cumulative

paralysis at sea, culminating in the collapse of the campaign ashore.

In passing, it may not be out of place to point out that war with our real and very good friends in America, no matter how revolting or unthinkable, is in no way *strategically* impossible, unless indeed we surrender, or perhaps sell, our West Indian bases to Uncle Sam, and remain in strategical bondage to oil. The oft-repeated claim that Canada is undefended is not quite correct. Temporary occupation, it is true, is always possible, as it is in the case of any overwhelmingly numerous people, but by her sea-power England can finally, if she stands by her guns, compel the richest and most powerful land-dog to drop its bone. Blockade, the bloodless economic policy, is a weapon to which there is no counter in the absence of a decisive sea victory by the blockaded Power. This extreme, and indeed absurd, case of America is mentioned for one reason only. It well shows that elemental nature of victorious sea-power of which the great American seamen of the present, as of the past, are so well aware.

Reverting to the example of a maritime war in the Far East, it need hardly be said that nothing is further from the author's mind than the likelihood of any quarrel with our faithful friends, the Japanese. Thousands of Englishmen regard the severance of our alliance with our Eastern friends as perhaps the greatest political blunder of these post-war years, years rich, in all conscience, in political and diplomatic blunders, and betrayal of friends to placate

rivals. No harm can accrue from stating in plain terms a strategical situation known intimately to all Japanese sailors with any pretence to strategical understanding, and recently set forth clearly by the Tokio correspondent of *The Times*. The author selected this particular example because of its simplicity. It indicates clearly the true goal of all sound strategy, and simply emphasises that it is upon the battle fleet, and the battle fleet alone, that all true defence ultimately rests. Any excess over the barest needs in local defence measures, *specialised* trade defence vessels, air organisation, submarines and so forth, is a waste of effort and money and a source of weakness, in so far as the cost and effort of such excess provision weakens our striking power at the decisive point, which is always, and for all time, opposite the guns of the opposing battle fleet.

In conclusion, the author would apologise if he has been guilty of over-emphasis of what will be regarded as strategical platitudes by many naval officers, though by no means by all. It is really essential, however, to fix firmly in our minds the dominating and unchanging principles of effective sea strategy in all their simplicity, for only thus can we visualise with confidence and clearness, in clear-cut instead of blurred outline, the nature of those new navies which will most efficiently and inexpensively meet the naval requirements of all nations with responsibilities to their countrymen and countrywomen on the mighty highway of the sea.

With the foregoing strategical conceptions in view,

and treating a decisive fleet action as the one true purpose for which the new English fleet must undeviatingly be trained and planned, no matter what variations of circumstance any particular campaign may be expected to introduce, we must now pass to a general consideration of the general types of vessels that will best fulfil the supreme function for which the Royal Navy exists.

We shall also consider very shortly the nature of the fleets that seem necessary to those other great naval Powers which may still look for a great sea victory against an initially stronger Navy, notwithstanding that their fleets may be materially less in total tonnage and numbers. Some reference will also be made to the naval provision that seems necessary for those great little seafaring countries for whom a sea victory is impracticable and unnecessary, and which, from the nature of things, do not contemplate or fear great sea actions.

CHAPTER XI

FUTURE CLASSES OF SHIPS EXAMINED

IN the preceding chapter it was shown that a decisive fleet action is the event for which the New Navy must exclusively be planned. To say this is not to overlook that, pending such action, and when the opposing main fleets are in being and alert, there will be need of ceaseless activity in the defence of our own trade against cruiser or submarine action by the enemy; action on our part against enemy commerce, largely by blockade, and perhaps the support of military expeditions of our own while preventing the movement of enemy troops to a beleaguered point by sea. By one of these two latter activities, or, in an extreme case, by the successful prosecution of our own commerce, we shall eventually force the enemy to face our main fleet which has been designed and trained for this decisive event. These subsidiary activities will be discussed later, however, and in the first place it is proposed to consider carefully the general nature and composition of that main fleet with which we shall eventually oppose our opponents when strategical necessities compel them to put their sea-power to the supreme test of battle.

What classes of ship must this fleet contain in order to render it a perfectly balanced instrument

for obtaining decisive victory over the enemy whatever the composition of the enemy's fleet may be? The basis of such a fleet is, of course, still the battleship, notwithstanding the batteries of criticism which have been levelled against it by those who regard the failure of Jutland as inherent in a modern navy, and who regard the late war, whether ashore or afloat, as a criterion for any future war.

Having said that the battleship is still the basis of sea-power, it is necessary to emphasise at once that by battleships are not meant those vast floating colossi which have already been severely criticised. Neither is meant that vague conception conjured up by the loose term "capital ship," a term that means nothing and should be allowed to die a sudden death. By a battleship is meant a battleship —just that—a ship, in fact, which can meet with confidence any ship opposed to it. The exact nature of the ship in view will be reserved for future description, but it may be said at once, in order to relieve any possible apprehension, that although the new battleship will be a vessel of the highest fighting power that our present great knowledge will enable us to construct, capable that is to say of tackling any vessel that the enemy can bring against it, the tonnage and cost of such a vessel need be but a fraction of the tonnage and cost of our latest mastodons, *Nelson* and *Rodney*, or indeed of any other of our existing battleships.

The battleship thus remains the core of modern

sea-power, from which all other classes of ships derive their power to operate consistently and indefinitely, and therefore successfully, on the high seas. But as in past centuries, so today, the battleship requires the active support of lighter and swifter vessels. In the days of sail these vessels were frigates. Today they are cruisers. Now what is the precise function of cruisers? It is a matter of the first importance to keep our minds as clear as crystal on first principles. If we have any doubt as to function we shall assuredly construct vessels which will fail us at every turn, no matter how costly, swift, or "scientific" these particular vessels may be.

The *primary* function of cruisers is to assist the battle fleet to obtain decisive victory; their *secondary* function being the defence of trade and transports prior to the fleet action, which latter function, as will be shown, is in no single particular at variance with the primary function, being indeed complementary to it.

A naval engagement between battle fleets will of necessity be preceded by a cruiser engagement, the initial tactical advantage being in the hands of that Admiral who is best served by his cruisers, the duty of which is to give early information of the position, course, speed, tactical disposition and numbers of the enemy battle fleet while preventing the enemy cruisers from obtaining similar information for their Admiral. Thus the Admiral informed of his opponent's position may be enabled to place his fleet between the enemy and his line of retreat, and, with

his slower fleet, force action on an opponent anxious to avoid a decision.

Initial touch between the far-flung cruiser lines having been achieved, a cruiser action will develop, the object of which is to disable or sink the opposing cruisers, thus leaving the victors at liberty to shadow the enemy battle fleet and report its every movement and action.

An Admiral deprived of adequate scouting on his behalf, approaching an enemy's fleet fully informed of his movements, composition and position, is deprived of all initiative in the forthcoming engagement and is thus on the high road to defeat before a shot has been exchanged between the battle fleets. An Admiral with a victorious cruiser screen has eyes. The Admiral deprived of cruiser support is blind and reduced to guessing.

The overwhelming importance of efficient scouting, in all weathers, for the battle fleet requires no emphasis. Indeed, today there is a tendency to treat " reconnaissance " as an object in itself, to treat the fleet, in fact, as existing for reconnaissance rather than reconnaissance for the fleet. Thus we see means of scouting piled upon means by the provision of a fleet of six Brobdingnagian aircraft carriers for the operating of a few aeroplanes which, under extremely favourable conditions, are merely an addition to orthodox cruiser work, and in no single particular a substitute for it. In moderate weather, and disregarding bad weather, aeroplane reconnaissance is likely to be conspicuous by its

absence. The whole question of aerial work with the fleet will be dealt with in detail in a separate chapter, and it is only mentioned here to illustrate the great store rightly laid upon scouting for the battle fleet.

Treating, therefore, the urgency of cruiser work with the battle fleet as an axiom, what is the general nature of the cruiser that will best serve our purpose? Without going into exact particulars at this stage we can say at once that our advanced line of cruisers must consist of homogeneous vessels of high speed, *relative to the speed of our own battle fleet*, and of good fighting capacity, capable, that is to say, of giving and receiving hard knocks. They must, in fact, be armoured cruisers, capable of dealing effectually with the enemy's cruisers and of achieving a decisive victory over them if they attempt to pierce our own cruiser screen. The question of speed will be discussed separately, but an indication of the author's argument in this respect has already been given when he says that the speed of our cruisers must be high *relative to our own battle fleet*, thus revealing one vital aspect of a properly balanced fleet.

We have now reached the conclusion that battleships and armoured cruisers must find a place in our New Navy, but what of small craft which, in the past generation, have been synonymous with torpedo craft? At this point the author would draw attention to the lessons of the late war discussed in the earlier part of the book, and to his criticisms of

the torpedo as a weapon in surface ships. There is no need to reopen the attack on the torpedo as a weapon. The author intends in these latter chapters to be constructive, and to that intention he will cling.

Though it can be, and has been, shown how absurdly limited is the torpedo in its capacity to get home, and thus to achieve concrete results, and how great is the effort and expense involved in the employment of this bogey, it is clear, none the less, that its employment by an adversary will affect adversely the tactics and conduct of our own battle fleet if the opposing torpedo craft are improperly *countered*, even though the torpedo in the future is treated only with moderate respect instead of with that fear which, as we now know, amounted in the late war to unjustifiable panic.

The torpedo generally entails great effort and drastic manœuvre to get it into action at all against the enemy. Though a nuisance, its impending attack can often be foreseen and therefore countered tactically, and, what is of vital importance to remember, *the torpedo is not a counter to the torpedo*. The destruction of the craft that carry it is the active counter, and this must be achieved in the future, as at present, by gunfire. Hence the unsatisfactory compromise involved in what are called torpedo-boat destroyers, which, however, are now pre-eminently torpedo boats, and destroyers only secondarily, and therefore inefficiently.

It has already been emphasised that the essence

of sound policy, circumscribed as all policy must be by financial and economic considerations, is to concentrate on essentials and to let go entirely of non-essentials. It is upon the gunfire of the composite torpedo boats that we now rely in the main for the breaking up and dispersal of torpedo craft formations, as it is upon the gunfire of the heavy guns of the battle fleet that we depend for decisive victory over an opponent. Is it not wise, therefore, to forego the use of the torpedo in surface ships of all classes and to simplify and perfect our means of defeating the enemy craft that carry this weapon of chance ?

The author advocates, for the foregoing reasons, that our present composite T.B.D.s shall give place in our New Navy to vessels armed only with the gun, and well adapted therefore for the overpowering of enemy torpedo carriers. Thus, with the torpedo eliminated from all vessels employed with the battle fleet, the Admiral will be free to employ the decisive weapon, the gun, with complete freedom from tactical preoccupation in the launching of torpedo attacks, and with single-minded attention to the real business in hand—the gun action. Such considerations bring us to the third class of ship, and the last, which should find a place in the battle fleet of the New Navy.

We need, in fact, high-speed second-class cruisers which are heavier than our present T.B.D.s, and with a powerful quick-firing gun armament. The precise characteristics of these second-class cruisers, whose functions in a fleet action are mainly those

of our present T.B.D.s, when used as destroyers, will, like the other vessels, be described in detail in the next chapter, but here it may be said that their speed must be high *relative to our own battleships and armoured cruisers*; they must be robust and seaworthy to insure that they can remain in company in all weathers; they must be sufficiently numerous to permit of disposition on the engaged quarter as well as on the engaged bow; and they must possess an endurance approximating to the endurance of the battleships and armoured cruisers. In short, they must be *balanced* with the battle fleet as a whole, and carry the secondary armament now mounted in the battleships.

Thus in the battle fleet of the future we shall have battleships, armoured cruisers, light second-class cruisers, and nothing else.

But what, it may be asked, of great battle-cruisers, aircraft carriers and fleet submarines? Is there no place for these most modern of fighting craft? With regard to battle-cruisers the answer seems to be this: The very high speeds and heavy guns which characterise these vessels necessitate great tonnage, inadequate docking facilities away from home ports, fantastic horse-powers and therefore extravagant cost. Few of such vessels can therefore be constructed, and these, even so, cannot successfully face, as they may subsequently be forced to face, battleships. It is true that a great fleet of battle-cruisers like *Hood* and *Renown* could put a fleet of armoured cruisers of moderate tonnage, mounting guns of

medium calibre, out of action, but no nation's resources are limitless. Against a great superiority in numbers of such armoured cruisers as will be described in the next chapter, a few battle-cruisers could be outfought. Two battle-cruisers, at long last, sank the *Scharnhörst* and *Gneisenau*, it is true. Had, however, one battle-cruiser opposed the two, the story would have been a very different one. We therefore discard the battle-cruiser on the ground of cost and therefore lack of numbers, and also for lack of docking facilities throughout the world.

The case against the aircraft carrier will be dealt with separately under the naval Air Arm, and nothing further will here be said on this matter.

The reasons for excluding the fleet submarine—that is to say, the large, fast, ocean-going submarine—from the fleet of the future, are many, and are as follows:

The fleet submarine, like any other submarine, cannot combine satisfactorily the qualities of a surface vessel and a submersible one. Fifteen years of prodigious effort and outlay have proved this. Steam, still the pre-eminent source of power for speed in ships, has already been abandoned, and the K class of submarines have been scrapped. Internal combustion propulsion for large fleet submarines of high speed has proved unsatisfactory on many grounds, the need of greatly increased weight of plant for a moderate increase of power being an important one, and it can truthfully be said that

experience with X1 has been disappointing in the extreme. The saturation point has, in fact, been reached.

There is no need here to go in detail into the technical difficulties of constructing fleet submarines which are capable of holding, and maintaining for long periods, their allotted station with orthodox surface vessels. It is enough to say that fifteen years' of effort and outlay have left us with the technical difficulties unsolved. The failure of a solution of the technical difficulties involved, obstinate as it has so far proved, is, however, incomparably the least of the indictments against this class of vessel.

Let us assume for a moment that technical difficulties of construction and engineering have been triumphantly surmounted. What is their *function*? On the surface they are, by common consent, valueless. They cannot fight, or escape, without submerging, and when submerged they are reduced to a speed which renders them little better than mobile mines. Like all submarines they rely for action upon their target coming obligingly, and unconsciously, into their very limited danger area, an area increased to a relatively small extent only by their own power of motion submerged. They must dive before being sighted on the surface, for if sighted, even for a moment, their prospect of attack is completely shattered. This means that they must dive eight to ten miles from the most advanced vessel of the enemy's fleet, perhaps fifty or sixty miles from the battle fleet.

However stationed relatively to their own fleet, submarines are dependent upon mere chance for an opportunity to reach a firing position, such a chance under full speed action conditions being remote indeed, as exercises under circumstances carefully arranged for the submarines' benefit have repeatedly proved. Fleet submarines, being of necessity large, are correspondingly of large turning circle and consequent unhandiness against fast-moving ships, so much so, in fact, that should chance provide an opportunity to attack, the attack is more than likely to fail. Should however the submarines, by extreme good fortune, achieve a suitable torpedo-firing *position*, the torpedoes themselves may fail to hit, as even the most enthusiastic torpedo specialist will readily allow. Finally, should a torpedo, by an extraordinary combination of chances, make contact with a ship, the result is not likely to be unduly devastating against a properly constructed modern battleship.

Over and above all these grave limitations to the usefulness of the fleet submarine itself, and of its weapon the torpedo, there is the serious tactical preoccupation of the Admiral, who will be tempted to lure the enemy towards his submarines, diving far astern of his battle fleet or cruiser line. Thus the ideal tactical dispositions and courses for the gun action, by which alone decision can be achieved, may be upset by the endeavour to bring the submarines into contact with the enemy, or, to put it more accurately, to lure the enemy—a free agent—

into touch with the submarines. Thus it is the old story of twisting and deflecting sound tactics to enable a particular piece of material to be brought into action, a distortion never necessitated by the one true weapon—the gun—because guns are the ready servant of ideal tactics and can be effectively employed under almost any circumstances.

On the foregoing grounds alone the fleet submarine should quietly disappear from our future fleet, but the case against these vessels is very greatly strengthened when the prodigious cost of submarines per ton is considered and compared to the cost of simple orthodox surface tonnage. Not only are the submarines themselves extravagantly costly, but they still require those bugbears of a strictly limited Navy, *depot ships*, which can only be provided at the cost of surface fighting ships. Submarines will, to the end of the chapter, require depot ships and relief crews, which constitute a heavy non-effective millstone round the necks of submarines of all sorts and sizes.

The value of fleet submarines for fighting purposes is now widely questioned in the Navy, but many naval officers still defend their future construction for purposes of *shadowing* an enemy fleet, thus usurping, or reinforcing, the functions proper to cruisers. Shadowing is surely, of all functions, the one least capable of efficient execution by a submarine of any class. The power to shadow necessitates the power to fight for position. This a submarine cannot do. A submarine must dive at extreme visibility from any surface vessel if her presence is to be concealed.

A small detached surface vessel on the distant flank of the fleet can insure that a submarine will be forced to dive and thus be rendered blind and almost stationary while the fleet she desired to shadow and report upon fades over the horizon and away. Neither can she report movements as seen through her periscope, for while submerged her wireless is inoperative. Thus a fleet submarine cannot undertake, in any respect whatever, the duties of a cruiser, while the attempt to do so is an admirable example of redundancy and thus of wasted effort.

Eliminating therefore the fleet submarine from our future fleet for the reasons given, and the aircraft carrier for reasons to be stated later, we are left with a fighting fleet of battleships, armoured cruisers and small armoured cruisers, all of which vessels are armed appropriately and exclusively with the gun, and all of which have been designed with a single eye to a fleet action, and that action a decisive one. Before passing from the main fleet as designed and organised for battle to a brief consideration of activities and duties separate from a fleet action, there remains one vital matter to be discussed which concerns the main fleet as a balanced whole and that matter is *speed*.

In criticising, as he has done in previous chapters, the world-wide craze for extreme speed, the author is well aware that he is at variance with what is now almost a religion in the post-war world. He feels himself to be guilty of something akin to blasphemy. Competitive speed is, however, one of the least of

the requirements of that New Navy which we are endeavouring, in imagination, to construct. It has been emphasised, perhaps to the point of tedium, that the whole preoccupation of the Navy in time of war should be to bring the enemy to decisive action; an object that cannot be achieved by speed, as has been shown elsewhere, and as the late war so abundantly proved.

The means of compelling action are, as they have always been, strategical and not mechanical. The enemy must persistently be presented with a situation which renders the defeat of the opposing fleet the only alternative to growing impotence at sea, and this persistent pressure is not dependent upon, or seriously influenced by, speed. In a fleet action or a cruiser action it is true that a slight excess of speed in an opponent gives him some slight tactical advantage, but an advantage immeasurably outweighed by the greater fighting strength of the slower ships, which, if properly handled, will operate on interior lines. It is, of course, true that the enemy's greater speed may, though not necessarily will, enable him to break off the engagement, and it is true that higher speed may enable him to avoid action altogether. But the author's whole case is that the enemy *must* seek action or continue progressively to suffer the stranglehold that will overthrow him. This being so, his extra speed can only be used to bring him to us at a cost in fighting strength which will prove a deadly handicap to him in the day of battle.

To those who argue that his extra speed will enable him to choose the range, it is only necessary to say that our slower and more numerous ships will be better equipped to fight at any range than are the faster ships of the enemy, for we have utilised the space and weight of redundant boilers to meet precisely this situation, both in armour and guns.

Finally, it has been argued by a famous Flag officer, who is in general agreement with the author's views of sea-power, that a speed at least equal to the enemy's is required to insure that the battle is decisive, the point being that the enemy may run before his defeat is complete. There seem to be two answers to this argument. The first is, as already stated, that failure by the enemy to defeat his opponent, and the sustenance of heavy damage to his fleet, can only accentuate the growing pressure on his country that the action was undertaken expressly to release. The second answer is that in practice, and especially in very high-speed modern ships improperly protected, the damage to the enemy's fleet is likely to be so severe that its mean speed will be reduced below the originally slower speed of its adversary, so that few ships will escape, and surrender will be the only, but very proper, alternative to destruction.

Further reference will be made to this question of speed when discussing naval activities prior to the fleet action—defence of trade, blockade and so forth. For the moment, however, we will confine ourselves to the speed of the main fleet in action. If, then,

extreme speed can only be purchased at the expense of the fighting qualities of the ship—assuming as we necessarily must, some limit to the *total* tonnage of any navy—and if high speed is inoperative in forcing action on an enemy anxious, for excellent reasons, to postpone it or to avoid it altogether, should we not boldly abandon extreme speeds in our future ships of all classes? There is no half-way house, for manifestly a 27-knot ship is no more capable of hunting down or chasing a 30-knot ship than is a 23-knot ship.

The practice has grown of matching speed against speed. Competition in speed is rampant, with all its repercussions on cost and fighting weakness. It is generally argued that the speed of British ships *must* be related to the speed of foreign ships. Indeed, to meet speed with speed is now treated as a matter of necessity as well as common sense. The author is convinced, none the less, that there is a fallacy in the generality of arguments on this vital matter.

He believes that the ideal mean speed of a properly designed fleet is an *absolute* and not a *relative* matter, a matter, in fact, to be decided by our own fighting characteristics and strategy and not by the speed of our opponent's fleet. Similarly the maximum speed of our cruisers, of both classes, should be related to the speed of our own battleships, and not to the excessive speeds that foreign navies may see fit to install in their latest cruisers and destroyers. This difference of conception is fundamental, going as it does to the very root of sea-power and to the design

of new British ships in the coming years. How this ideal speed is arrived at will be discussed, with other details of design, in the next chapter, and the author will here content himself with saying that great sea-keeping capacity at slow speeds will be a characteristic that will overshadow, and largely govern, all other characteristics in the ships he has in view.

We can therefore conclude this general consideration of the nature of our future fleet by describing it as a relatively slow fleet (as speeds are now reckoned), of great sea-keeping capacity, and carefully balanced in its component parts with the battleship, which is the keystone of the whole structure. This fleet will consist of battleships mounting the heavy gun only, armoured cruisers armed with homogeneous guns of medium calibre, and light second-class cruisers equipped with the powerful quick-firing armament withdrawn from the battleships.

Turning from the battle fleet, and the fleet action for which the fleet as a whole has been exclusively designed, it is necessary to examine shortly those other activities that will be required of the Navy pending that fleet action which, if victorious, will enable us to disperse our fleet, including our battleships, for any duties that may be necessary.

These activities are, for the most part, concerned with the protection of our own trade from cruiser action by the enemy; with the closing down of all sea-borne goods destined for the support of our opponents, whether carried in his own or neutral

bottoms, and with the denial of sea transport to military expeditions while securing freedom for our own.

Taking the protection of our own trade first: as already emphasised, sustained attack, as opposed to raids, can only be carried on within the strategical limitations imposed upon the enemy by lack of fuelling bases and friendly harbours, so that the areas in which powerful protection will be needed are limited and known, and it is upon the defence of trade within these limits that we must of course concentrate. Though we must be prepared to counter a determined attack on our vital trade routes by hostile submarines as well as by cruisers, attack by submarine is a form of attack which, in the future, will require no great provision of material in times of peace. The late war proved conclusively that if ships are grouped in the open seas and oceans, few of such groups of vessels sailing in company will be located by submarines. A large concentration of ships is little more liable to detection than is a single ship. If, on a rare occasion, a large group of merchantmen is located, an enemy submarine will be forced to attack submerged, and though an odd ship in such a group may be torpedoed, the crew will be saved by other vessels in the vicinity. To guard against the employment of the gun by submarines it is only necessary to insure that a percentage of the merchant vessels themselves carry guns.

To those who object that we should make pro-

vision against the loss of even an occasional ship out of a group, it need only be said that it cannot be done. No escort can prevent the discharge of a torpedo from a submerged submarine, or certainly detect the presence of a submarine that has not previously betrayed her presence in the neighbourhood. Escorts on the high seas should not therefore be provided for, in so far as submarine attack is concerned. The defence under these circumstances is, in the first instance, strategical—that is to say, the policy of grouping and "routeing": tactical defence is provided by zigzagging, if considered necessary, and material defence against the employment by the submarine of the gun is adequately met by the arming of a proportion of merchantmen.

In the *approaches*, where groups of merchantmen will converge, and where groups may be split up for passage to different ports, escorts will be necessary, as it is here, and here only, that the submarine can expect a fair supply of targets and therefore valuable results, and it is here therefore that they will be compelled to operate. In such localities small auxiliary vessels, properly armed and provided with the new detecting device will, by their mere presence, compel the submarines to remain continually submerged and thus greatly handicapped. Here also, if any submarine compromises herself by exposing her presence by a hostile act or by being sighted, it will be subjected to concentrated attack by depth-charge.

Though without our present means of detecting and hunting submarines, the foregoing tactical and strategical plan proved, in the later stages of the war, entirely satisfactory in scotching the submarine attack on commerce. The unchanging limitations of the submarine insure that similar methods in any future war will prove similarly effective; indeed more so, because we have the experience of the past to guide us, reinforced with improved means of detecting, hunting and destroying submarines.

Thus against submarines no specialised men of war are required. The popular belief that a fleet of foreign submarines necessitates a counter-balancing fleet of T.B.D.s has nothing to support it. It is quite true that T.B.D.s *can* be used for countering the submarine, but when so employed their particular and extravagantly costly characteristics become inoperative. Submarines must be hunted and attacked deliberately and at *slow* speed. The torpedo armament of T.B.D.s is useless, as also is the gun. The depth-charges as carried in a T.B.D. are no more effective than when carried in a drifter or trawler. It is sometimes argued that their very high speed (not available, incidentally, at the unexpected moment of sighting a submarine on the surface) enables them to close the submarine rapidly. The answer, of course, is that if the submarine dives on being sighted, as she always will, at a great distance, the extra speed of the destroyer will only bring her a few hundred yards nearer to the submarine before it disappears on an unknown course. To build fleets

of destroyers, costing hundreds of thousands apiece, seems not unlike filling a house with steam-hammers to crack the walnuts. In short, for countering submarines, small auxiliary vessels, such as trawlers, are sufficient, and can always be obtained at short notice. The armament and detecting devices for such vessels alone need provision in time of peace.

A determined attack by cruisers on our vital sea-borne trade is, on the other hand, a very great danger and one that must be met by ample cruiser provision in times of peace. Here no hastily collected material will avail us on the outbreak of war.

That we may expect such an attack on our food supplies, *and on the limited oil supplies not cut off at the source*, is certain. Indeed, a successful interference with our oil trade alone would put the Navy out of action almost completely, the Army with its vast mechanisation to a dangerous degree, and the Air Force absolutely. Our reserves of oil, if unreplenished with a steady stream from foreign countries, and in all cases from overseas, would not enable us to continue the struggle for many months. The present dependence of England upon sea-borne foreign oil has at least doubled the Navy's responsibilities in the defence of the country, thus entailing an additional heavy burden in cruiser tonnage.

How then is an attack on two streams of vital traffic—Food and Oil—to be met? The answer, it need hardly be said, is by concentrating the food-ships and tankers in convoy, and by the provision of an adequate number of escorting cruisers.

Defence must be true defence, and no mistake about it. Successful defence of the full supply of these two necessities will be for us the equivalent of a great *tentative* victory—tentative, that is to say, until we have engaged the opposing battle fleet, victory in which engagement will render our tentative victory absolute. Failure to protect our food and oil would enable our opponent to avoid a fleet action and would constitute a final and decisive defeat, necessitating surrender.

Here once again we find ourselves in collision with current doctrine and policy. We are at present busy on the construction of a great fleet of "ocean greyhounds," as innocent of all protection from gunfire as they are devoid of fighting worth. Their mission is to "scour the seas" in search and pursuit of enemy cruisers similar to our own in speed and lack of fighting capacity. Why such ships? And why such a mission of hide and seek? The speed of our cruisers will not enable us to *catch* those of the enemy, though if the enemy *elects* to engage at the fantastic ranges now contemplated and catered for (the length of the range being admittedly the only means of defence on either side) chance will mainly settle the issue of the engagement. The author cannot follow the argument, if indeed there is a coherent one, for the excessive speed of our new cruisers designed specifically, *mirabile dictu*, for protection of trade. Cudgel his brains as he will, he cannot see daylight in our present cruiser policy.

It seems abundantly plain that for trade defence

we require well armed and well armoured cruisers in which high speed is the very least of all requirements. Our cruisers, for their trade defence function, require only sufficient speed to make them highly mobile relative to the 8 to 10-knot convoys which it is their vital business to defend and to shepherd into harbour—in fact, a speed which will enable them to be manœuvred quickly into the correct tactical position for their action against the oncoming enemy "ocean greyhound." If the very high-speed enemy cruiser attacks our slower armoured cruiser it will assuredly be sunk. If, on the other hand, our opponent sheers off, as he will be well advised to do, it is true that our own cruiser will be unable to bring him to action, but the enemy has failed in that very object for which his high-speed cruisers were primarily designed, and our vital trade goes steadily and quietly on. Even supposing that our cruisers have a speed equal to the enemy, or even a knot in hand, such speed would certainly not enable them to engage an unwilling opponent because, among other reasons, they would not have steam for full speed at the time that it was required.

If it be argued that with cruisers of slower speed than that of the enemy we are relying on passive defence, and that true defence is offence, to use the tiresome catchphrase from the staff colleges, it need only be said that in this cruiser warfare, pending the fleet action, the means of bringing the enemy's "greyhound" to action is, once again, a strategical

and not a material problem. The enemy's fast cruisers must eventually return to their ports, and it is in the approaches to their port that they can eventually, though not certainly at the first endeavour, be brought to action by slower vessels, reinforced if necessary by our battleships, a predicament for the enemy that may force them into a great sea-battle which it should be our unceasing effort to provoke. Thus for the defence of convoys and for the attack upon enemy cruisers great speed is not required, neither, in view of the great sacrifice that must be made to attain modern excessive speed, is it desirable.

As for the defence of trade, or of troopships, so for purposes of *blockade*; fighting strength and not speed is the vital requirement. *Moderate* speed only is required for all functions proper to cruisers. Thus it will be seen that we require no specially constructed trade defence cruisers whatever. The armoured cruisers, designed exclusively for service with the battle fleet, are ideal also for trade defence and blockade, their secondary functions. Where the anticipated scale of attack is light, our second-class light cruisers, also designed exclusively for their work with the battle fleet, will serve our purpose admirably.

We are thus left with our original three classes of ship, the cruisers of which are perfectly and equally adapted for the fleet action, for the defence of trade and transports, and for the blockade of the enemy. Our cruiser fleet is purely a question of *numbers*.

Though the author is disposed to think that there is a tendency to over-estimate the least number of cruisers that we must maintain in commission, it is very clear that we require a fleet of cruisers considerably in excess of those required solely for our balanced battle fleet, and numbers very much in excess of those required by any other nation not dependent, as England is, for 80 per cent. of her food, and all her oil fuel, upon oversea transport.

Notwithstanding our utter dependence upon seaborne trade, over-insurance is only a little less dangerous than under-insurance, because it breeds suspicion and mistrust, and hence competition, in other countries, and political and economic troubles at home. We should also bear in mind, as already pointed out, that great cruiser activity on the part of the enemy can only be carried on by stripping his battle fleet of those cruisers which are as necessary to the enemy for a successful fleet action as they are to ourselves. Thus we shall be able to detach cruisers from our battle fleet while the enemy is doing the same thing, and thus revealing plainly that no fleet action is immediately pending.

Is there, then, no specialised class of vessel required in our New Navy beyond the three classes already postulated for our battle fleet? Yes, we require a certain number of small submarines to act as a deterrent against protracted bombardments of important bases and dockyards, and as a powerful deterrent against any serious attempt at landing in force. Such action by enemy vessels, though strate-

gically of little, if any, value, causes a bad impression in the country. Against such action submarines are valuable because the target comes to the submarine, thus eliminating the greatest weakness of these vessels. In such submarines surface speed, again, is of no importance, the need being underwater handiness and a large simultaneous discharge of torpedoes. Indeed, in submarines alone should the torpedo survive as a weapon, though in this particular case it is valuable.

We shall also require a limited number of specialised mine-sweepers to insure the regular and assured clearance of important channels through which the fleet or convoys must pass, such flotillas forming the nucleus, as at present, of that larger fleet of sweepers drawn from the trawler fleets in time of war. The provision of mine-sweepers can, however, be greatly diminished by reliance on the paravane in open waters.

And lastly, we shall always require the necessary number of river-gunboats for those duties which they today perform so admirably. Thus in our New Navy we shall require battleships, cruisers (of two types), small submarines, mine-sweepers and river-gunboats. Such vessels, in adequate numbers, will fulfil all our requirements in war, as in peace. With such a fleet we can pass quietly from peace to war, if that grim necessity arises, without a tremor of anxiety or panic, and without that feverish and ruinous mass production of new war material that was such a marked feature of the late campaign.

So much for the British fleet, but what of foreign navies? It need hardly be said that if the reasoning on the true nature of sea-power is sound, the navies of other first-class Sea Powers will have to conform in their general nature to our own, for it is the whole basis of the argument that without a properly balanced battle fleet, irrespective of its size and numbers, no effective sea-power can exist. Other nations may build fleets of high speed cruisers, submarines, torpedo craft and aircraft carriers, and for a time carry on a species of guerilla warfare with varying success. The time however will inevitably come, and under modern conditions quickly, when the British battle fleet, upon which all our naval activities lean and from which we derive our power of sustained action, must be engaged and disposed of if our opponent's guerilla warfare is not to be left, so to speak, in the air, hanging like the round world upon nothing.

It seems to follow, therefore, that foreign navies will gradually retrace their steps to fall into line with British principles of strategy; resting all their ships upon a battle fleet which, so long as it remains "in being" and therefore threatening, renders Britain's dominion on the sea *conditional* and *tentative*, liable at any moment to challenge by a numerically smaller fleet. The British main fleet will thus be forced to remain concentrated and alert against her opponent's materially weaker fleet. France, through the centuries, has taught us to respect the power and potentialities of a materially weaker

fleet when employed on sound strategical principles, and handled and fought with that tactical skill and bravery which England by experience has learnt to expect in her European friends—" the enemy."

At the same time it is clear that materially weaker navies will require a different balance in their fleets to that of stronger navies. The strategical requirements of all nations differ. The fleet action is generally, in the case of the weaker fleet, an event to be *postponed*. It may well happen in the future, as it has so often happened in the past, that a skilful opponent may seize, or make, an opportunity presented by an error or over-confidence in his adversary to divide, attack and overcome a portion of the opposing fleet, thus by one victorious action reversing the strategies proper to the opposing navies, a fact which reveals at once the value of a strong but, at the outset, weaker fleet.

This vital consideration should act as a corrective to the extreme materialist who is too prone to judge the outcome of a sea war by counting ships and minutely weighing up material. *A sound sea doctrine widely understood and accepted in all countries, is perhaps the surest bulwark against feverish competition in naval armaments*. It is under the false materialistic doctrine of the past generation that suicidal competition in material, largely of no fighting value, has thriven rankly. Naval warfare is an art, and not a dull and dreary mixture of pseudo-science, industrialism and Big Business. Cruisers and small craft, resting upon a small but still respectable battle fleet, will generally

predominate in a weaker navy and will present the stronger navy with many of those puzzles and strategical dilemmas which are inherent in sea-warfare, and which have revealed themselves in all campaigns. Such puzzles must be met on our part by skill and seamanship and not by a dull exhausting competition in material in times of peace. It seems, therefore, that it is little short of an impertinence for England or America to attempt to coerce the great European navies and the Navy of Japan into a particular class of construction, or to forbid other nations to build submarines. The submarine, like any other vessel, rests on its merits. Those naval Powers to whom sea-power is not, as in the case of England, everything, will be wise to construct many submarines for the outlying defence of their ports, thus rendering close blockade by a stronger sea-power more difficult. We need not fear ocean-going submarines if other nations are so unwise as to construct them. We surely need not anticipate that France and Italy, or Japan, will emulate the late German policy of the black flag which the Germans themselves have now courageously and honourably disowned. The real point is, however, that we need not *fear* such action because we know, as other nations now know, that we can counter such action simply and effectively. It therefore seems, in conclusion, that other first-class Sea Powers will develop navies similar in general outline to our own, though balanced somewhat differently in the proportion of one class of ship to another.

The smaller nations like Denmark, Greece, and Holland will develop small surface craft, *and particularly submarines*, for the defence of their neutrality and territorial waters against all comers.

Let us, therefore, hear no more of "yard sticks," but let all nations gradually rebuild their navies on an absolute basis, a basis, that is to say, which serves each one's strategical concepts and particular requirements. On such a basis competition in speed, calibre of gun, and individual tonnage becomes meaningless, the only competition that we have to guard against being in numbers, a form of emulation that will soon die down when we cease to interfere with one another's strategical conceptions and instead exhibit a little good humour, mutual forbearance, accommodation and common sense, all of which curbs on competition will be powerfully buttressed by economic considerations in the coming years.

CHAPTER XII

A FIGHTING FLEET

UP to this point the argument has been restricted to general principles of sea strategy and to the classes of ships that will be required to embody and exploit these strategical conceptions. With these general principles the great body of seamen will, it is confidently believed, find themselves in harmony. It is now our business to pass from the general nature of our future ships to a detailed consideration of their characteristics. It is not to be supposed for one moment that naval officers will agree with the author, or indeed among themselves, on all details. It is hoped, however, that the ideas now to be set forth may be of interest, that they may contain good seed, and that the reasons for the advocacy of particular characteristics will at least be perfectly clear.

We commence, naturally, with the battleship, and we adhere to first principles as surely as a limpet adheres to its rock. Our minds' eyes must, moreover, be fixed on our own strategical principles rather than on what we suppose, perhaps erroneously, to be those of an opponent, and we shall disregard entirely any existing ships in our own or foreign navies. The author, in fact, invites naval

officers to think and plan on an *absolute* foundation and not on a *relative* one.

It was to some extent the failure to design our ships on this principle—that is to say, to build the most efficient ships that were possible—that gave Lord Fisher his excuse and his opportunity to introduce suddenly the all-big-gun battleship which rendered pre-existing ships obsolete. Such battleships were possible, and undoubtedly desirable, many years before the *Dreadnought* was spectacularly launched with a fanfare of trumpets. Lord Fisher's Dreadnought policy shows most clearly the extreme danger of deliberately, or inadvertently, building a fleet of ships of less fighting worth than existing knowledge makes possible. Vessels limited *by agreement* below the highest standard that knowledge enables us to construct are at the mercy of any man or country that suddenly decides to scrap the navy of a possible opponent.

A principle to be kept in mind is a great *sea-keeping* capacity, and here at once it is necessary to distinguish between sea-keeping capacity and *radius of action*. The latter term has grown into prominence owing to the increasing tendency to plan for *particular* wars, the function of the Plans Division of the Naval Staff. This tendency must almost inevitably lead to specialised vessels, an undue and therefore undesirable preoccupation with the idea of a particular war and thus perhaps a tendency to kindle it. Furthermore, in the material sphere, there may be a risk of excessive fuel provision, calcu-

lated mainly on a basis of economical speed between widely separated ports, but with an enormous margin for those very high speeds which drink up fuel as a drunkard swallows spirits.

We seem to require a fuel capacity in our new ships that will enable them to keep the sea, at very slow speed as opposed to economical speed, for extended periods running perhaps into months. Such a fuel capacity will not need to be related to any specified passage at economical speed, for it will prove sufficient for any passage that our ships can be required to perform between British fuelling bases. It will be necessary, furthermore, so to design our ships that the fuel, up to the last ton, can be conveniently fed to the furnaces, thus diminishing the exertion to the duty watch of stokers, whose work will continue for long periods.

At this early stage of design it is not necessary, or possible, to give a figure for the fuel provision, this being manifestly bound up with the tonnage and speed of the vessel. It is mentioned first, however, because great sea-keeping capacity is an essential ingredient of all sound sea strategy of a great maritime Power, and it must, therefore, ever be present in our minds as we proceed step by step to design our battleship.

The next point to be considered is the *nature* of the fuel, and here it will only be said that in the New Navy we must not contemplate the use of any fuel but British coal with the single exception of oil in submarines, where it is, of course, essential. The case

for coal as against oil has been examined in another chapter, and here the author will confine himself to saying bluntly that a navy dependent upon foreigners for the power to move a propeller is a fantastic navy indeed. How a return to coal can be simply achieved, with a gain rather than a loss in efficiency, will reveal itself, it is hoped, as the argument develops. We have, therefore, to design an ideal coal-burning battleship of great sea-keeping capacity. That is our problem.

Now these two characteristics, the use of coal and great sea-keeping capacity, can be attained by two means and by two only. One method involves a great hull tonnage, and the other the installation of moderate speed, implying a great saving in horse-power and consequently in boiler and engine weight and space. But a great *reduction* of tonnage, as has already been emphasised, is of the first importance, not on grounds of expense, which is an *incidental* advantage only, but on grounds of the tactical advantage of numbers and thus of fighting strength. It seems clear, therefore, that the speed of our future battleship will be moderate. The term "a sacrifice of speed" is studiously avoided because the word "sacrifice" implies the foregoing of something in itself valuable. The whole argument has been that high speed is not *required* in the battleship.

Our new battleship will thus be a coal-burning vessel of great endurance and moderate speed. Her tonnage and speed cannot yet be defined, however, for these characteristics are governed by other

features yet to be discussed. They will settle themselves in due course, as will be shown.

Though the tonnage cannot yet be laid down, one thing about it can be said definitely. The tonnage will be the least that will enable us to equip our battleship with the best weapons and protection that our great knowledge of guns and armour enables us to design. Speed and fuel will be determined by the reserve of buoyancy of the hull that has been ideally fixed by guns and protection.

The next matter to which attention must be drawn is the question of *protection*. Because our battle fleet must be capable of overpowering, if properly fought and handled, any concentration of force that can be brought against it, it must certainly be able to withstand for a time, though not of course indefinitely, a hammering from the heaviest gun, and we can say at once that the protection round vitals must be sufficient to provide very sound defence against any gun that an opponent can reasonably employ. Conversely, every part of the ship in which damage is not of decisive importance should be of the lightest construction that is consistent with sound and balanced design, light enough where possible to permit shells to penetrate as *shot*.

Though not strictly falling within the category of armour, the internal construction under water must be rich in subdivision, present "bulges" giving place to internal treatment. Here it is relevant to mention that the coal bunkers will provide valuable protection against under-water damage. The correct

position of the armour will reveal itself when we come to consider the armament, but here again we can say generally that the armour must be so placed as to provide its maximum protection at what transpires as the ideal fighting range, that range, in fact, which in the future we shall strive by every means to achieve.

Thus we now have a coal-burning, heavily armoured battleship of great endurance and moderate speed. The tonnage and speed are still open questions, and must remain open, until we have determined that over-ruling characteristic of our vessel which, it is sincerely hoped and believed, will settle the question of tonnage, speed, and correct placing of the armour for us without any effort of thought on our part on these questions *per se*.

It need hardly be said that the over-ruling characteristic of our battleship, the characteristic that will settle the still open question of tonnage, speed and fuel, is the *armament*. Our problem is not one of mounting the greatest number of the greatest guns that a *predetermined* or internationally agreed tonnage and speed will permit. Rather is it to discover the least tonnage that will ideally mount an armament that gunnery officers regard as ideal for obtaining decisive victory over any ships and guns that can be brought against us. We must now, therefore, consider in detail the armament we wish to employ, keeping our minds rigidly fixed on first principles.

In the first place, as all naval officers will readily admit, we should make no provision beyond the

bare minimum that will provide us with our maximum effective hitting power. Economy of effort is a golden rule in material as it is in the strategy that determines our material, and indeed as it is in all human activities.

First of all is the question of *range*. It seems evident that we should limit the range of the gun to a range which permits us to see our target. Not only so, but we should, surely, limit the range of our guns to a range at which hitting is reasonably possible. Outside such ranges the very slight chance of a hit does not justify us in distorting the design of our armament, and thus of our ship, or of unduly expanding our supplies of ammunition which unpractical ranges necessitate.

Aircraft spotting at extreme ranges will be entirely disregarded at this stage, the reasons for such disregard being reserved for discussion in the chapter that deals with the Naval Air Arm.

It will be clear that the range limits that we place on our armament will only be such as must be equally deterministic in the case of the enemy, so that with regard to range there will never be any question of an enemy being in a position to utilise his extra speed for choosing a range at which we cannot engage him. The limiting of the range to practicable proportions will simplify, it should be said in passing, our future gun-mountings, and will also considerably lighten them.

On the question of range we are thus in a position, for the first time, to be explicit. The maximum

range of our heavy guns will be 22,000 yards, 2,000 yards in excess of that 20,000 which, by the very general assent of our younger gunnery officers, is the extreme limit of practicability, that is to say, of practicable hitting range. A margin of 2,000 yards is allowed in order to give some elevation in hand to counteract a list due to damage, and for wear and tear of guns.

The question of range is thus simply determined, but the *calibre* of the ideal gun for our ideal battleship is a more intricate problem. What, in the first place, is our conception of the ideal gun? To answer this satisfactorily we must be very clear in our minds as to the object we have in view. May not our objective be stated somewhat as follows: Our ideal gun must be of a nature, if skilfully handled, which is capable of destroying any ship that an enemy can expose to its fire at any practicable range? This requirement may be said to be self-evident, but there is another requirement which cannot be so simply stated, and it is this: Our ideal gun must be of such a calibre that the *resultant* of several possible and important characteristics is ideal. Thus there is the question of the weight of the gun and mounting, the weight of individual projectiles, the weight of the ammunition supply as a whole, the rate of fire and the muzzle-velocity of various calibres which affects angle of trajectory. On the operational side there is the question of ease of handling, involving simplicity or otherwise of design. It will be very generally admitted that it is

by no means the case that a gun of very great calibre has necessarily an advantage over one of lighter calibre.

Great calibre, such as 16-inch, involves great weight in the gun and mounting, greatly increased weight in the ammunition supply or, conversely, a reduced number of rounds in the locker. Thus an increase of tonnage over the tonnage required to mount a similar number of guns of a lighter calibre is essential. Again, the life of guns of great calibre is notoriously short, thus involving recurring expense in replacement, rapid deterioration in performance pending replacement or, if rapid deterioration is to be avoided on account of the grave expense of replacement, insufficient practice with full charges. The rate of fire of very large calibre guns with excessive ranges is appreciably less than for lighter guns.

Yet again, the greater tonnage and therefore size of the vessel required to mount a given number of guns of great calibre, implies that such a vessel is a *larger target*, and it is clear, therefore, that the vessel mounting very heavy guns is more vulnerable on grounds of tonnage and size alone. Thus to take an extreme case, at very great ranges a vessel presenting a size of target only half that of her adversary can theoretically, and on the basis of chances, afford to dispense with half her ammunition, or, on the same number of rounds, can reasonably expect to score two hits to her opponent's one.

If, on the other hand, the tonnage and size of the

vessel mounting the heavier gun is reduced by reducing the *number* of the guns she carries, the vessel of the same tonnage, with perhaps two more guns of lighter calibre than her rival, has a marked advantage from a *hitting* point of view, as gunnery officers will allow. A case in point is the *Iron Duke* with ten 13·5-inch guns as opposed to the eight 15-inch guns of *Royal Oak*. So much for the debit side. On the credit side we have the possibly, though not necessarily, increased effect of a hit from the projectile of very heavy calibre.

Let us turn now to the 12-inch gun, the least calibre, it is believed, that can rightly be regarded as a heavy gun suitable for use against a heavily armoured battleship at long ranges.

Here, on the debit side, we have the probably, though again not certainly, reduced effect of a single particular hit. This disadvantage is, so far as can be judged, the only one.

On the credit side we have all the advantages accruing from reduced weight to set against the serious disadvantages of the increase of tonnage necessitated by the employment of guns of heavier calibre.

In finally determining the calibre of gun for our future battleship we need, therefore, to aim at the lowest calibre that will enable us to hit, and to keep on hitting, at all practicable ranges, a heavily armoured opponent with shells that will be *effective*.

In this connection we shall do well to remember the effectiveness of the fire of German 12-inch guns

employed against vessels of our own more heavily armed. At the same time it would be unwise to jump to the conclusion that 12 inches is the ideal. After careful enquiry among responsible gunnery officers of the younger school, the author is disposed to conclude that the destructive effect of 13·5-inch guns as compared with 12-inch guns is sufficiently marked to outweigh, though very slightly, the disadvantages of increased weight, and therefore increased size and tonnage in the larger vessel required to mount them, other characteristics of the vessels being equal.

The ideal calibre, the saturation point of gunnery efficiency, seems to hover round a point between 12 inch and 13·5 inch. The author will, therefore, be explicit and conclude that 13·5 inches is the gun that should be mounted in our new battleships. He is of course open to correction by gunnery officers, but 13·5 inches represent a gun and mounting of which we have good experience and which has given admirable shooting results. A 13·5-inch gun will be capable of meeting effectually any vessel that carries any other gun that the art of man can devise, and at any range the enemy may select if circumstances give him the initiative in the matter. Taking 13·5 inches, therefore, as the ideal calibre, the next question that arises is the ideal number of such guns to be mounted in a single ship.

Here we are at once faced with alternatives. Let us assume that for political or economic reasons our battle fleet broadside of the future is limited to

160 such guns. Such a limit is purely arbitrary, but that circumstances will fix some limit is clear. With 160 guns to the broadside we can elect, for example, to mount 10 guns in 16 ships, 8 guns in 20 ships, or 6 guns in 27 ships (if we increase our broadside of 160 by 2 guns).

In deciding on our policy there are several uncontroversial factors to be borne in mind. Thus, ten 13·5-inch guns require a very great tonnage to mount them adequately, both on account of weight and space. Great tonnage introduces docking restrictions in all parts of the world. It places many eggs in a single basket which is as vulnerable to gun-fire as a smaller vessel, if the smaller vessel is correspondingly armoured and perfectly designed. The chances of a hit on the larger vessel are considerably increased, not only on account of the greater size of the target she presents, but because one ship cannot efficiently engage two at the same time, whereas two can engage one if necessary. Thus the larger ship will always be under fire from the smaller, while some of the smaller ships will be totally immune from attack by their opponent's gun-fire.

So much for the debit side. On the credit side there is some advantage of gun-control when a large salvo is employed, and thus an increased chance of hitting the smaller vessel from this cause; an advantage offset, it must be repeated, by the reduction in size of target, and thus of the chance of hitting the smaller target.

Turning from the 10-gun vessel to the other extreme of the vessel mounting 6 guns only, such a vessel has all the advantages due to a great reduction in size and tonnage which the 10-gun vessel has to forego. The fleet so armed can oppose the enemy's 16 ships with 27 armed with equally effective weapons. It is possible that gunnery officers may consider that 6 guns in one vessel are insufficient to ensure good salvo firing, but the author's experience as control officer in a battle-cruiser, admittedly not an extensive experience, or one upon which he would presume to be didactic, inclines him to the view that with 6 guns very accurate shooting can be made, and he is convinced that the great advantages to be obtained by *numbers* of vessels far outweigh any possible loss in the ease and efficiency of control involved in the reduction to six guns in one firing ship. *Numbers* of ships is a matter of supreme importance to a fleet which intends to keep the sea for extended periods, not only on tactical grounds, but because it enables units to be detached without risk of a debacle from a slightly less powerful battle fleet in the hands of an opponent always alert for such contingencies.

We can now therefore give a third explicit figure in the analysis of our new battleships by fixing the number of guns to be mounted at six.

The next point to be decided is the method of mounting these six guns. We may mount them as six single guns, in three turrets or in two. Here the incidence of numbers is reversed. The more gun

positions mounted in a single ship, the greater the chance of some positions being hit. On the other hand, one hit leaves more guns in action. We may rule out of account six guns mounted separately on grounds of ship construction alone, and we are left, therefore, with a choice of two triple turrets or three twin turrets. It appears that on the ground of chances the pros and cons of twin and triple turrets nearly, but not quite, cancel out, because one hit may well damage two turrets if superimposed. For this reason it seems fair to say that on the grounds of chance alone two triple turrets have a very slight advantage, as they would be well isolated from one another.

Turning, however, to other aspects of the question, it will at once be admitted that a great saving in weight and space can be achieved by mounting three guns in a single turret, so that from a purely ship design aspect two triple turrets are ideal. On the other hand, there are certain operational objections and gun-mounting difficulties in triple turrets which may outweigh the advantages. The author cannot say which method, on balance, is the better, so he will conclude by saying that the six 13·5-inch guns will be mounted either in two triple turrets or three twin turrets. Now how does our battleship shape?

She is a heavily armoured, coal-burning vessel of great sea-keeping capacity, of moderate speed, and armed with six 13·5-inch guns of a maximum range of 22,000 yards, mounted in two triple turrets or three twin turrets, two forward and one aft.

Thus a *form* is materialising out of the ghost of abstract principle.

The tonnage and speed are still, however, vague. It has already been said that the tonnage will not be fixed arbitrarily, but will be allowed to *emerge* from the armament characteristics which, in the last analysis, will fix it. We shall eventually be able to fix the tonnage at the least figure which will give an ideal form to our battleship as a stable but mobile seagoing gun-platform.

Returning therefore to the armament, having fixed the main armament, what of the secondary? Here the author would restate his conviction that the essence of sound construction, as of that sound strategy which material implements, lies in the ruthless elimination of all non-essentials.

For what purposes does the existing secondary armament of battleships exist? For the defence of the vessel against torpedo craft. Just that and nothing else. It is clearly of little, of any, value for the attack of the opposing battleship because its range, in the absence of freak mountings, will generally be inadequate, disregarding the ineffectiveness of 6-inch shells against a heavily armoured battleship. Assuming, therefore, that the secondary armament is for the purpose of engaging torpedo craft formations, we see at once that we are merely reinforcing one of the functions for which our fleets of torpedo boat destroyers exist. In fact, we are hedging. We do not, in fact, trust our T.B.D.s.

Such a lack of confidence in these composite craft

has in the past, perhaps, been justified, though it is perfectly well known that the secondary armament of battleships performed no useful service in the late war. It is argued that the secondary armament must be retained because T.B.D.s are insufficiently robust to insure that they will be with the fleet when the need for their co-operation arises. Their duties as torpedo craft may interfere with their duties as destroyers. These doubts are well-founded and form, indeed, the very grounds upon which it has been urged that our present composite torpedo craft should be expanded into small, robust, high-speed second-class cruisers while shedding their torpedo equipment. Thus we can insure that these vessels shall be with the battle fleet under all circumstances; that they shall be sufficiently numerous for correct tactical disposition in the van and rear of the battle fleet; and that they will be ideally adapted for dealing with the enemy's torpedo craft, if, as may be doubted, surface torpedo craft are perpetuated in foreign navies.

We can therefore transfer the secondary armament bodily from the battleship to the second-class cruiser, leaving our battleship to mount six 13·5-inch guns and nothing else whatever, beyond a few 12-pounders and maxims for landing purposes and a moderate anti-aircraft equipment.

Here at one stroke we simplify our battleship and reduce its tonnage to a very marked degree. With the disappearance of the secondary armament we save the weight of the guns and mountings, no in-

considerable figure, a saving of weight particularly valuable when we reflect that this weight is placed high up in the ship. We save also the weight of the ammunition and of the armoured shields which nominally, though not in reality, protect the guns' crews.

Weight, however, is possibly the least of the saving, the greatest advantage of all being the saving of *space* which is so fruitful a cause of the need for a great hull tonnage. Not only do we save the space required for the guns, mountings and ammunition, but, what is of even greater importance, we save the space necessary for the accommodation of the guns' crews. Not only does the reduction of the ship's company to the barest necessities of a six-gun ship enable the tonnage of the vessel to be greatly reduced, but it enables us to increase to the maximum those water-tight subdivisions which saved so many German ships from loss and which, in their case, were largely made possible, as already shown, by the absence of living accommodation for great bodies of men over long periods.

The jettisoning of the secondary armament has not been urged *in order to reduce the tonnage of the ship*, for such reasoning would contradict the whole argument. It is eliminated because it is *unnecessary*, and the advantages in reduced tonnage are, therefore, *derivative*, leaving us with our ideal armament intact. Our battleship will therefore require a tonnage sufficient only to mount adequately a total armament of six 13·5-inch guns and to provide adequate

protection to enable it to remain in action, and endure punishment, for extended periods.

We are now getting near to the point at which the vital question of tonnage will settle itself, and at this point it is necessary to refer once again to the speed factor which becomes the deciding factor in the final design of the ship and in the assessment of tonnage. There are clearly two ways of settling the speed of our battleship, which has to mount six 13·5-inch guns. We may fix the speed arbitrarily, in which case the tonnage must be adjusted to enable sufficient horse-power to be installed to attain the predetermined speed. Thus we may decide that the speed of our future battleship shall be eighteen, twenty or twenty-four knots. By this method the tonnage of our battleship will be the least that can mount six 13·5-inch guns and permit of the installation of the power required for the speed selected.

The alternative method is to fix the tonnage, regardless of speed, at the least figure that will adequately mount the six guns and, in the hull thus determined for us, to install propelling plant and fuel for which space is available.

In the former case speed is selected and tonnage conforms.

In the latter case the tonnage is settled by the protection and armament and speed and fuel have to conform to the tonnage.

It need hardly be said that the latter alternative is the correct one for reasons which the whole strategical argument makes plain. By this method

we obtain our ideal fighting hull and armament, and a battle fleet of numerous small vessels, instead of a few mastodons. The cost of such a fleet will be found to be very greatly reduced and the speed of the battle fleet, though moderate, will be reasonable.

It is not suggested that these figures are perfectly accurate, but after careful discussion with engineer officers and constructors of high standing it transpires that the tonnage of our ideal ship will be about 12,000 tons, and the *natural* maximum speed approximately 17½ knots. Endurance can if necessary be increased by reducing the maximum speed.

With regard to the *armour*: this must be of a thickness over vitals estimated to give protection against the heaviest shell we can reasonably contemplate, and taking the 16-inch gun as this maximum, the armour must be designed accordingly. It should be said, in passing, that the tonnage will be fixed for us by the armament plus the armour. The armour must be so placed as to provide its maximum protection at the range which gunnery officers agree to be the ideal fighting range of the ships we have so carefully designed. Investigations place this range at 15,000 yards or less, and this is the range, therefore, at which the Admiral will endeavour to engage. Such a range, while remaining decisive, introduces the factor of superior skill and training into the engagement, and further brings into full play the great advantage of reduced size of target which our battleships, if smaller than the enemy's, present.

And finally with regard to *coal storage*: such a tonnage as we have allowed first principles to settle for us permits of a coal storage that *will* enable such ships to keep the sea at very slow speeds for long periods. Those who doubt that such is the case seem to be rather in the position of those who doubt that Truth, though of infinite aspects, is one and indivisible. It is an undeniable fact that if we adhere loyally to first principles in the major characteristics of a composite created edifice the whole is perfect, no part being at variance with another part. This truth finds its supreme expression in the human body where perfect knowledge has gone to the design and its embodiment. It is equally true of man's creations when he submits the construction of the governing features of his machine to the rule of first principles and law, utilising all his knowledge to the full, never overstretching any law, much less transgressing it, and rightly employing that economy of effort (with a margin for miscalculation) which is the secret of all successful design as it is of effort in every sphere. Balance in design is the gauge of adherence to first principles of fighting, a perfectly balanced ship or fleet being synonymous with Truth.

Any discussion of internal details of our battleship must be foregone, and a natural professional taste for enlarging on every trifling characteristic must be curbed. It will suffice to say that our new battleship may be defined in all vital characteristics as follows:

She is a coal-burning vessel of 12,000 tons, heavily

armoured to meet shell of 16-inch calibre; her maximum speed is 17½ knots and her horse-power 12,000. Her sea-keeping capacity at slow speed is great. Her armament consists of six 13·5-inch guns mounted forward and aft in two triple or three twin turrets, and the guns are sighted to a maximum of 22,000 yards. Her armour is placed so as to present the maximum protection at 15,000 yards because this is the ideal fighting range. Her open spaces between-decks are the minimum that will comfortably accommodate a crew of 600 men, and her water-tight compartments are numerous. Her form is such as will give her armament an ideal gun platform in a seaway. Her masts and yards are restored to her, and her internal equipment is of the simplest. Her cost is approximately £1,000,000 at the present low purchasing value of money.

Having approached the design of our new battleship in considerable detail, and having given a reasoned argument in support of each characteristic advocated, we will confine ourselves to little more than a bare statement of those characteristics which the remaining classes of vessels attached to the battle fleet—the cruisers—will exhibit. If the plan of approach to the design of an ideal battleship is sound, by the same methods we shall achieve ideal cruisers exactly balanced with the battleship.

In our cruisers, however, there will be this fundamental distinction from the battleships in design. Whereas in the battleship we accepted for our speed the maximum that could be installed in a tonnage

fixed exclusively by our selected armament and armour, in the cruiser, on the other hand, we must select our speed in advance, on tactical grounds, and build our ship round the speed as well as round the armament. Thus the battleship is designed on strategical principles and the cruiser, mainly, on tactical.

It is the author's whole case that the speed of the cruisers must be fixed with reference to our own battle fleet and not to the speed of foreign cruisers. This being so, an excess of speed over the battleships of 6 knots is required by the armoured cruisers, giving them thus a speed of $23\frac{1}{2}$ knots. They must also have a sea-keeping capacity equal to that of the battleships. Thus the tonnage of the armoured cruiser will be such as will provide adequate space for the installation of horse-power for a speed of $23\frac{1}{2}$ knots and for the mounting of six 9·2-inch guns as the exclusive armament, the armour being selected and placed on the same principles as in the battleships.

After careful study and inquiry it seems that the armoured cruiser of the future will be a coal-burning $23\frac{1}{2}$-knot vessel of 12,000 tons with a sea-keeping capacity similar to the battleship. Her horse-power will be approximately 25,000. She will be armed with six 9·2-inch guns mounted in two triple or three twin turrets forward and aft, and her armour will be sufficiently heavy to meet, with a fair prospect of success, the attack of guns of a slightly heavier calibre in enemy vessels.

On the same principles of design the second-class cruiser will be a coal-burning 27-knot vessel of 4,000 tons, with a sea-keeping capacity similar to the other vessels. She will be armed with six 6-inch guns, and will be totally unprotected by armour. The only remaining vessels in the British Navy—small submarines, mine-sweepers, river gunboats and surveying vessels—will be designed with a single eye to their special function; speed in all three cases being the least important characteristic; to be accepted, in fact, at a figure that the least tonnage needed to embody the special function of the vessel makes possible.

One general reflection only remains to be stated, and it is this: Such a Navy as has been described should last not for years, but for more than a generation. In the absence of some great new discovery bearing some such relation to steam as steam bore to sail, or the modern gun to the old muzzle-loader, vessels such as have been described could not become obsolescent or obsolete. Steel ships maintained and refitted with that conscientious care for which the Navy and Dockyards are famous, and for which the country has always ungrudgingly made financial provision, should have a life as long, or longer, than the old ships built of wood, and sheathed with copper, which sailed the seas successfully for as much as forty years before they were laid to rest on the scrap-heap.

In conclusion it may be of interest to contrast the author's fleet with the fleet that we possess today.

The total tonnage of the Navy in commission and under construction is approximately 1,357,704 tons. This vast aggregate does not include a large cruiser and destroyer tonnage in reserve.

The distribution of this tonnage amongst the various classes of ships is as follows:

	Tons.	*Average Tonnage.*	
17 Battleships	458,460	26,500	Heavy guns 138.
4 Battle cruisers ..	122,700	30,500	,, ,, 28.
49 Unarmoured cruisers, including fifteen 10,000-ton cruisers	299,150	5,700	Composite armament of 124 8-inch guns and less.
8 Aircraft carriers ..	117,700	15,000	—
15 Depot and repair ships	120,134	8,000	—
98 Torpedo craft ..	114,275	1,150	—
63 Submarines ..	64,000	1,100	—
33 Sloops	17,050	500	—
6 Monitors	23,735	4,000	—
18 River gunboats ..	9,480	520	—
9 Surveying ships ..	11,080	1,200	—

Total 1,357,764 tons, mounting 166 heavy guns of 13·5-inch and above, 120 8-inch guns, and a number of lighter guns of 6-inch and below.

Now let us consider a navy of a similar total tonnage, but consisting of vessels such as have been described. Our New Navy will, as stated previously, contain mine-sweepers, surveying ships, river gunboats and small submarines, so that if we utilise the tonnage at present devoted to these special auxiliary

vessels we have available for the purpose 101,610 tons. Leaving the individual tonnage of surveying ships, mine-sweepers and river gunboats as at present, but employing small submarines only, we have 64,000 tons available for submarine construction.

Taking 400 tons as the correct tonnage for a small submarine, we can thus have 160 such vessels instead of our present 63 vessels of all shapes and sizes. Battle-cruisers (of existing type), aircraft carriers, torpedo boats, monitors and depot ships find no place in our New Navy. We therefore have available for battleships and cruisers the not inconsiderable figure of 1,256,094 tons—say, 1,200,000 tons in round numbers.

We may balance our fleet in several ways, according to international circumstances at any particular period, but in view of our great responsibilities in safeguarding our food and oil supplies we will err on the side of liberality in cruiser construction.

Let us therefore fix the proportion of battleships, armoured cruisers and unarmoured cruisers in the ratio of 2 : 3 : 3. Thus of the total of 1,200,000 tons available we utilise 300,000 tons for battleships, 450,000 tons for armoured cruisers, and 450,000 tons for unarmoured cruisers.

With our figure of 12,000 tons for a battleship, 12,000 tons for an armoured cruiser, and 4,000 tons for an unarmoured cruiser, we thus obtain a fleet of:

Twenty-five 13·5-inch gun 17½-knot battleships.

Thirty-eight 9·2-inch gun 23½-knot armoured cruisers.

One hundred and twelve 6-inch gun 27-knot unarmoured cruisers.

Such a battle fleet mounts a broadside of 150 13·5-inch guns against our present battle fleet's 138 heavy guns of various calibres.

Against the twenty 15-inch guns of the battle-cruisers we can bring 228 9·2-inch guns sighted up to a range enabling them to engage at 20,000 yards.

In the case of unarmoured cruisers we can bring 672 6-inch guns, mounted in 112 vessels against the very scratch and mixed armament of our 49 unarmoured cruisers, including the new 10,000-ton cruisers, which are considerably more vulnerable than the author's vessels on account of the great target they present.

In place of our existing 63 submarines we have 160 small low-speed submarines.

The mean speed of our new battle fleet is 17½ knots, while the speed of our present battle fleet is as high, but not higher than, the speed of its slowest ship—about 19½ knots.

For the defence of trade, pending the fleet action for which our new fleet has been designed, we have a great reserve of cruisers capable of defeating any high-speed unarmoured cruisers of any nation that attempt to interfere with a convoy.

In which fleet, in peace or in war, would naval officers elect to serve?

CHAPTER XIII

BLOCKADE

THE weapon, or policy, of blockade is as elemental in its nature as it is universal in its daily application. Every man and woman employs this form of coercion, in one way or another, in the course of private life. It is a sensible and highly effective method of bringing pressure upon some person or persons to be obedient to an opposed will. It is still a potent and humane weapon in the hands of wise fathers in dealing with recalcitrant or passionate children. If the domestic blockade is effective, and not run, so to speak, by other members of the family on behalf of the blockaded party, the master of the house can bring children quietly to reason without that violence and passion which too often embitter relationships in years to come: simplifying to the barest necessities a child's rations, or removing his toys, is no cruelty, for the child has the remedy for his discomforts in his own hands, as we who were once children with wise fathers very well know.

Has not this homely example of our experiences of domestic blockade a very real bearing on the policy of international blockade, as opposed to blood-letting, in the great family of nations of which each particular nation is normally a friendly mem-

ber, given however to quarrelling like the individual members of a family?

During the past years the principle of blockade has been challenged on a strange variety of grounds, often contradictory. Some oppose it on the ground that it constitutes in the hands of a great Sea-Power a weapon so potent as to render such a Sea-Power the virtual arbiter of the world's fate. Others regard it as a fruitful source of international friction rather than as a weapon of exceptional potency.

The commercial Interests oppose it in the expectation of financial loss in years to come if a good peace-time customer, and a yet better customer as a belligerent, is subjected to this form of economic exclusion. Others perversely oppose blockade as a policy on the ground that England has most to lose by the retention of this mighty instrument in the invisible international armoury owing to her complete dependence on sea-borne oil and food, and the supposed gravity of the submarine threat.

Yet others, dragooned into that intellectual fog known as "air-mindedness," have been educated into regarding blockade as diabolically cruel when contrasted with the decency and humanity of short, sharp, indiscriminate hooliganism against women and children by bombs from aloft.

Let us very briefly examine these various grounds on which the abolition or whittling away of blockade is championed today.

The objection that blockade as a policy puts a powerful weapon in the hands of England should

surely leave Englishmen unmoved by any other feeling than that of satisfaction. It costs little, no small consideration today, and it enables us by cumulative pressure, and without bloodshed, to bring about a frame of mind conducive to the compounding of the quarrel which we can rest assured will always be faithfully regarded as a righteous quarrel whatever a cosmopolitan group of "highbrow" and often atheistical gentlemen of all races and languages may say to the contrary. Is it not possible to be over-subservient to the purely commercial Interests, whether British or foreign?

The spiritual issues likely to be involved in any great European war should not be overruled by the commercial advantage or disadvantage of neutrals whose welfare is bound up inextricably with the issue of the war. At the same time it is fair to emphasise that great and small trading nations may gain more commercially by the economic blockade of a customer than they will lose, for the simple reason that the oversea trade of the belligerents, and more particularly of the blockaded nation, will fall like a ripe plum into the laps of those trade rivals not engaged in the dog-fight. The argument that England has more to lose by successful blockade than any other country is clearly true. She alone among the Western nations can be starved into submission in a few weeks. No other nation is in this position. The starvation of German children in the late war was not due to the blockade by England, but to Germany's own policy on the Continent and

to her wholesale conversion of foodstuffs into munitions of war in that fierce welter of massed material. The Belgians were starved by Germany and not by England's imperfect blockade of Germany.

Because therefore England alone is liable to spectacular collapse from the effects of blockade, is this to be used by loyal Englishmen as an argument for its abandonment? Surely not, unless the country has lost its ancient faith in the power of its Navy to prevent this disaster to herself, while imposing growing pressure on her adversary. It has already been shown that error in dealing with the submarine in the late war has led to a certain loss of trust in the security to be achieved by England's unaided sea-power, but it has also, it is hoped, been *proved* that this fear for the future is groundless.

It is not proposed to enlarge further on the controversies surrounding blockade in the past few years. We will assume that England is still alive to the fact that the power to impose or to prevent blockade is the very basis, the *raison d'être*, of her sea-power, and that a navy shorn of this power, this ancient maritime right, comes somewhere very near to cumbering the sea and wasting the taxpayers' money.

Neither is it proposed to treat blockade as an essentially English policy. It is to be championed as the ideal means of circumscribing and shortening wars for all nations to whom the sea is vital. In defending blockade as the right of all sea-faring nations England is defending a maritime right which

often in the future, as in the past, will tend to militate against our own immediate trading interests, except in so far as we shall secure a large share of belligerent trade, just as other nations will secure a large share of our trade and our opponents' in the unhappy event of another war in which we are involved.

Turning, however, from these brief, and indeed trite, reflections on the political and commercial aspects of blockade to the purely naval aspect of the question, there are several interesting points that deserve emphasis.

In the days of sail blockade was of necessity only partially effective. Scores of enemy ships slipped past the blockading fleet and frigates, which were dependent on such an inconstant factor as wind. Furthermore, wind was fuel to the enemy and not under his opponent's control, so that the enemy's ships could sail from all parts of the world without that let or hindrance introduced by their modern lack of essential fuelling bases. Thus, strategically, blockade could be but imperfectly imposed near the source of the enemy's oversea trade. In the absence of British men of war, which could not be everywhere, enemy trade continued to flow unhampered from the outlying world.

Modern discoveries have, however, changed all this and have incomparably strengthened predominant sea-power rightly used with manful determination. Steam and wireless now enable victorious sea-power to dominate enemy trade activity in all

the Seven Seas, the necessity of fuelling facilities circumscribing narrowly the areas in which active operations by ships are required, and to this extent reducing the size of the Navy that England requires for the defence of her trade, her island and Dominions, *provided always that no nation with lesser responsibilities at sea sets the pace in naval armaments.*

Thus the potency of blockade has been greatly increased in the hands of a victorious modern Navy. But this increased potency is derived from yet another source. Modern civilisation, and more particularly modern land-warfare, requires, according to current military doctrines, an endless stream of sea-borne material for the maintenance of belligerent power and thus of the belligerent spirit. With the exception of England, the least of these sea-borne necessities are *staple* foods, a fact persistently, perhaps deliberately, obscured by those who for one reason or another are fighting politically to strip sea-power of its very meaning.

On the vexed question of the rights of an oversea "neutral" to supply the blockaded country *indirectly* with war material through neutral but contiguous ports, it is not proposed to enlarge at length, but this much can be said. The late war was in many respects exceptional. Germany was surrounded on the north by neutral ports, and such a vast war of massed material, requiring an unending stream of sustenance from overseas, is unlikely to be repeated in the future when sound strategical doctrine has re-established itself in the military

world, as it seems likely to do in the not distant future. If, however, such conditions should be repeated, and neutral nations should be found to be importing contraband material greatly in excess of the known normal imports of such a country, steps will have to be taken to stop the importation of the superfluity. If such interference with neutral 'rights' involves the possibility of the conversion of an unfriendly neutral into an open enemy (a contingency unlikely to become a fact if England acts fearlessly), such a contingency must be faced in the future as in the past and must be dealt with on its merits when the dilemma arises. To take any other view is surely to admit the legitimacy and propriety of encouraging nominal neutrals, and only *individual* traders at that, to enrich themselves at the cost of the slaughter of their fellow-men.

Turning for a moment to a purely professional aspect of blockade, it is sometimes maintained that submarines now prevent the effective blockade of enemy ports, and blockade, to be justifiable, must be effective or else it degenerates into something like casual piracy. It is perfectly true that submarines have added a *complication* to blockading cruisers, forcing on the blockading fleet an extreme vigilance and added risks of casualties, and it is for this very reason that it seems grotesque to attempt to induce the lesser naval Powers to abandon the submarine as a weapon of sea defence. But though submarines render close blockade more difficult, something in fact more than child's play, they can-

not deter a determined foe from employing blockade effectually, as the Germans latterly discovered. It is easy to exaggerate the submarine menace to a few small blockading cruisers such as have been defined in a preceding chapter. Such vessels are small targets, and when employed on blockade duties, and thus without a definite passage to complete, they can be continually on varying courses in different localities at moderate speed. The lookout will be particularly sharp, and they will possess effective means of attacking submarines that have in any way exposed their presence in the vicinity. Submarine officers will be unanimous in admitting that such targets, when occasionally sighted, will be exceedingly difficult to hit. Misses with the torpedo will enormously exceed hits, and the risks that a few such ships will undergo from submarines are certainly not greater than the risks from weather, rocks and disease that our forefathers gladly underwent in their frigates in generations gone by.

In conclusion, it seems that belligerent powers and rights of blockade need to be restated and codified in International Law. If other nations refuse codification on the lines of buttressing the privileges of sea-power where they have been weakened, is it not time for England to reassert her independence and to recover for herself, and through herself for others, the full traditional powers which are in danger of being bartered away for some shadowy mess of potage?

The rights of blockade involve the right of search

in its strictest sense, and the full sway of the Prize Courts, whose integrity no one impugns and whose honourable tradition of even-handed justice other courts of law may well envy. Blockade in its strictest form will always in the future, on some occasion, be in the interests of some maritime nations and to the disadvantage of others, the advantage or disadvantage depending upon the particular dispute with which pacts and covenants are unable to cope.

Sea-power clothed with all those proper rights and legal powers which tradition assigns to it can be exercised effectively by navies of quite moderate proportions. If sea-power, on the other hand, is based upon unsound doctrine, the navies that give it expression will inevitably assume exaggerated, grotesque and extravagantly costly proportions, as the late war so disastrously exemplified, and as existing navies continue to demonstrate.

CHAPTER XIV

THE FUTURE OF THE NAVAL AIR ARM

IN examining the future of the Naval Air Arm the author wishes, so far as may be possible, to avoid controversy. He will commence therefore by assuming, in common with the bulk of responsible naval officers, that the Air Arm is, and must for all time remain, an auxiliary, just as the submarine service has always been an auxiliary to the Navy as a whole. No sailor, whose mind remains uncontaminated with "air sense" or "air-mindedness," will rate the Naval Air Arm higher than an auxiliary, capable of employment only when weather conditions are favourable, and then only to a strictly limited degree.

This being so, it will very generally be conceded that the possible advantages to be obtained from the use of aeroplanes at sea when circumstances permit must on no account be purchased at too high a price—that is to say, at a price which must seriously deplete the limited funds available, in the coming years, for fighting ships. What, in the first place, are the functions of aircraft at sea? They may be stated shortly as follows:

Aeroplanes may be used—

1. For reconnaissance.
2. For spotting for guns.

3. For bombing.

4. For torpedo attack.

5. For the attack of enemy machines engaged in similar activities, for the defence of our own special service machines from attack by enemy fighters, and for machine-gun attack on exposed personnel in the battle fleet.

Taking these functions in turn, the following comments may be made about them without fear of any strong dissent.

Reconnaissance.—Reconnaissance, or scouting, to use a good English word, is only possible by aeroplane provided that the weather is sufficiently fair for taking off from and landing on the carrier. This very important proviso governs the use of any aeroplane for any purpose at sea, and need not therefore be repeated when discussing other activities. The importance of this weather limitation, relatively absent in the gun, must always be kept in mind when contemplating the possible uses of aircraft at sea, and to a reduced extent on land. Indeed, to many naval officers this *inherent* disability is sufficient to raise the question as to whether aeroplanes at sea are really worth the effort and outlay that their employment up to the present time, and by present methods, has entailed.

Assuming, however, that the weather is sufficiently fine for aeroplanes to leave the carrier, and visibility adequate for their operation, the distance they can afford to penetrate is strictly limited, and the distance of the flight, or the time occupied in scouting, must

always be considerably less than is theoretically possible because a large margin of the limited fuel supply must be kept in reserve in case the carrier cannot at once be located on the return, and to meet the greatly increased fuel expenditure for a given distance over the sea in the case of wind *from any direction*. This, of course, is common knowledge.

Again, it will be admitted that the navigation of aircraft, if the wind rises or falls when absent from the carrier, may be inaccurate, thereby entailing at least an equivalent inaccuracy in any reports of the enemy they may make. A change of wind introduces also an acute danger that aircraft may be unable to locate or to reach the carrier when their fuel is running low, a fact which has led to many a disaster in the last few years.

It has already been pointed out, and it will hardly be disputed, that aeroplane scouting is in any case supplemental only to scouting by cruisers designed for this express purpose. Indeed, with more small cruisers at our disposal for extended scouting beyond the main cruiser line the present work of aircraft would be redundant altogether.

It will also be acknowledged that aeroplane reconnaissance as now practised is for the most part carried out against a fleet known to be, and arranged to be, in the vicinity, near enough, that is to say, to insure that the aeroplanes have a chance and are *exercised*. Surely this form of *exercise* in reconnaissance has little relation to a genuine search for a fleet whose whereabouts are unknown ? Surface craft can

scout hundreds of miles from the fleet, and keep on scouting, whereas aircraft can only do so for a few minutes near the limits of their range, where alone it is valuable, because a great proportion of the intervening distances between the aircraft carrier and the aircraft scouting limits is clearly wasted from a scouting point of view.

Notwithstanding these well known weaknesses in aeroplane reconnaissance, it may be admitted that aircraft may sometimes perform some useful service in this respect.

Spotting for Guns.—Here at first sight is an invaluable function for aeroplanes, and yet the disabilities and dangers of aircraft spotting are becoming increasingly evident, and admitted, by gunnery officers.

The aeroplane may not be there on the day, or if there it may be shot down. It cannot fulfil the vital requirement of all efficient control, the necessity, that is to say, of being *in the direct line of fire.* It cannot always differentiate between the salvoes of several firing ships. A false report of fall of shot is incomparably worse than no report at all, and, if differing from observation in the firing ship, the report must be disregarded or it will lead to confusion. Spotting reports by wireless may be jammed or even forged by the enemy.

On the other hand, an exaggerated belief in the value of aircraft spotting has encouraged the attempt to engage at impracticable ranges, thus leading to a waste of valuable ammunition, the supply of

which is not unlimited. A belief in the efficacy of aircraft spotting at fantastic ranges must inevitably affect, as indeed it has seriously affected, the design of our existing ships and guns.

All these facts are admitted by gunnery officers to a greater or less extent, and yet the author does not for a moment imply that aircraft spotting may never be desirable. There are rare occasions when it may be invaluable, as for example in the bombardment of oil tanks situated ashore, or against ships anchored in a harbour or inlet where direct observation is impossible.

Bombing.—The belief in the value of aircraft for the bombing of battleships is now dead. The insignificant weight of bombs that can be carried by a few bombers, coupled with the absurd ineffectiveness of a dropped unconfined bomb as opposed to a high velocity armour piercing shell, are facts now fully appreciated. Bombs cannot be aimed in the true sense of the term, for the reasons shown in "The Great Delusion"; neither is it possible in an aeroplane to correct the sights with information obtained from the last bomb. The author fears no contradiction from naval officers when he says that so far as bombing is concerned, aeroplanes are neither feared nor required.

Torpedo Attack.—Torpedo-carrying aircraft represent the very latest means of exploiting the aeroplane and the torpedo at sea, and it is not denied that under certain circumstances attack by torpedoes dropped from aeroplanes may be a nuisance, though

it can never be a serious menace to ships at sea. No wise man overlooks the fact, however, that exercises with torpedo-planes are *exercises* and no more. In these exercises every circumstance is in their favour. The weather is always favourable: no fire is opened on these slow-flying, ponderous machines: the carrier off which they lumber is immune from attack: interference with other flying operations while the flight of torpedo planes is being assembled on the flying deck of the carrier is cheerfully accepted. Furthermore, a hit from the small torpedo carried in an aeroplane is not a disaster to a properly constructed ship. The activities of torpedo-planes under real conditions of sea warfare are almost absurdly circumscribed when compared to the artificial environment expressly arranged for their benefit, and for *exercise*, in peace manœuvres, and yet it is not denied that their employment under suitable conditions may occasionally be advantageous, more especially against ships in harbours, and at anchor, which cannot be attacked by gun-fire.

Fighters.—On the question of fighting aeroplanes as a defence against other aeroplanes, we may all be content to accept whole-heartedly and without question Lord Trenchard's uncompromising view that "aeroplanes are the worst possible means of defence against other aeroplanes," a fact which has doubtless led the Air Ministry to construct three bombers for every fighter, and to cause every sensible person to inquire what is meant precisely by *Air Defence*. We may conclude, therefore, that in no

case do we require fighters except in so far as the aeroplanes provided for spotting and scouting can be given the necessary machine-gun to enable them, if circumstances permit, to fly low over exposed personnel, if indeed there will be any such in future ships, which the author is disposed to doubt.

We may therefore sum up those aeroplanes whose co-operation, under suitable weather conditions, the Navy of the future may require. Ruling out bombers, and fighters as such, we are left with aeroplanes suited to scouting, spotting and torpedo discharge. Having reached this point the question arises as to the best, simplest and least costly method of insuring that we shall have these aircraft available for their auxiliary functions when the vital fleet action is pending.

It has previously been argued that economy of effort is the secret of all successful action, and that full weight should be given to all *inherent* limitations in material as well as in strategy and tactics, undue effort to overcome inherent limitations being scrupulously avoided. Is it not therefore most desirable to admit and to accept the limitations of aircraft and to employ them when circumstances permit with the least possible sacrifice of strength in the battle fleet which can fight effectually under circumstances which entirely rule out the employment of aircraft in a fleet action. On this principle of economy of effort and expenditure is it possible to defend aircraft carriers as the ideal means of obtaining that aerial co-operation which must always

be dependent upon suitable weather conditions, and which at best is only auxiliary.

Let us consider shortly those striking weaknesses or aircraft carriers that are admitted by all naval officers, irrespective of the varying emphasis they lay on the fighting value of the Naval Air Arm. The cost of aircraft carriers has been prodigious in the past, and will so continue in the future. Few will deny this.

It is also a matter of common knowledge that the vulnerability of these floating aerodromes is particularly marked. Indeed, it is sufficiently grave to have given rise to a demand on the part of Commanders-in-Chief at sea for the detachment of cruisers from the main fleet, implying the need for yet more cruisers, for their especial protection against such a relatively weak craft as a T.B.D.

Vast as the latest of these mastodons are, the number of aeroplanes that they can accommodate is trifling. Trifling though the number of aeroplanes carried may be, the number that can be simultaneously operated is smaller still, while the diversity of the types of aircraft, and of their duties, makes it a matter of difficulty, and sometimes an impossibility, to organise the right types for flight at the right time, even though the Admiral's intentions in peace manœuvres are known by the staff in advance and accurately timed. Thus if spotting machines are away, but are due back shortly, the flying deck must be kept clear of other types of planes which may, however, be in immediate demand.

Then again, aircraft must leave the carrier exactly head to wind, and land on head to wind. Furthermore, the carrier must steam at high speed to enable the aeroplanes to leave and return to the flying deck.* Tactically such a necessity may be fatal, not only to aircraft co-operation, but to the safety of the carrier and the whole of her freight, for if the enemy is dead to leeward it is clear that the fleet and the carriers may part company at a combined speed of over 50 knots unless the fleet, or a part of it, keeps station on the carrier for her protection.

Thus it seems that the carriers and their aircraft must, under circumstances that may easily arise, enforce on the Admiral a form of tactics which, on all other grounds, is undesirable. His only alternative will be to abandon that Air Arm on which such a great effort has been expended and on which so much reliance has been placed. The battle fleet is thus very largely the servant of what is admittedly an auxiliary arm.

Those who frankly admit, and emphasise, these weaknesses not infrequently maintain, however, that the carriers are essential in order to provide a reasonable degree of safety to the personnel of the aircraft. But here again carriers seem conspicuously to fail just where it might be expected they would fulfil a useful, and indeed essential, function. Landing on

* On a calm day with anything but a very high-speed carrier the Gilbertian situation arises in which the aircraft cannot leave the carrier. In fact, aeroplanes at sea are almost as fastidious with regard to the weather as are airships in a shed when anxious to leave it.

carriers is a hazardous operation at all times, even in a slight sea way, as many accidents, fatal and otherwise, bear witness.

A much greater danger, however, lurks in this means of operation because carriers imply the use of land machines for work over the sea, so that any of the innumerable mishaps that may occur to aircraft in flight are likely to prove fatal. With a change of wind, loss of visibility, or alteration of the carrier's course the aeroplanes are likely to fail to return, and the employment of wireless as a guide to the absent aircraft, while by no means an infallible one, compromises the secrecy of the carrier's position and lays her open to an attack which, very literally, will leave the aircraft in the air till they fall into the sea. Furthermore, because aircraft must return to their carrier or perish, a large proportion of the limited fuel supply must be held in reserve for the contingency of not immediately locating her on the return. Thus aircraft operated from a carrier must sacrifice a large proportion of their endurance on this account alone.

If, then, these great, costly and vulnerable carriers are subject to so great a variety of inherent limitations in themselves, as well as imposing additional limitations on those of the aircraft they carry, can any substitute for this means of operation be found ? The answer surely is Yes—there is an alternative.

Every naval officer regards an aeroplane as an instrument—just that. The fact that it is self-propelled and man-controlled does not alter its

essential nature. This being so, should it not be carried in the vessels on whose behalf it is to be used, just as battleships and cruisers carry their own guns? In the case of land machines it may reasonably be argued, however, that they involve endless difficulties of discharge from battleships and cruisers. Not only are there grave material objections to the launching of land-machines from the decks of orthodox fighting ships, but the ships themselves are compelled to alter course into the wind's eye, perhaps at a critical moment in the approach to action, to discharge the aeroplanes. The machines once discharged are lost, and no provision for the safety of the crews is possible, an impossible position to all those who regard the V.C. or hari-kari spirit as the exception rather than the rule for the spirit that should inform all great concerted enterprises.

All this is true, but there is still an alternative to costly and vulnerable carriers, and to cumbrous, costly and dangerous catapults in battleships and cruisers. Is it not essential, in the first place, that all machines employed regularly over the sea should be seaplanes? Apart from all other considerations, it seems to be technically as well as morally wrong to call upon young officers, often married, to fly about over the sea in land machines. The author has had it from the lips of many young lieutenants, one since killed, and others retired from shattered nerves, that they knew themselves to be engaged in operations which were little short of suicidal. A faulty plug, a change of wind, a reduction in visi-

bility, exhaustion of fuel or any trifling mechanical defect, will almost certainly involve their death unless extreme good fortune intervenes. Can this be right? No weapon can be treated seriously as a weapon if its handling involves grave danger to the user. Guns, under such circumstances, would cease to be weapons in the true sense of the term. If, however, the use of land machines at sea is allowed to die out and *robust* seaplanes are substituted, the employment of aircraft at sea becomes orderly, rational, and therefore desirable.

The introduction of seaplanes would imply the disappearance of carriers because seaplanes *equipped with proper and adequate floats* could not be operated from the flying decks. But such seaplanes could very easily be discharged from battleships and cruisers by the simple process of slipping them into the sea and from thenceforth disregarding them till the impending action was lost or won.

Every disability now introduced by the carrier seems, by such a means of discharge, to fade away. The seaplane, it is true, could only operate in fine weather, but good weather already governs aircraft operations at sea. If the weather is fair the fleet has but to reduce speed for a moment, without altering its course, slip whatever type of aircraft it is desired to use, just as sea-boats are slipped, and proceed into action without further care or thought for the safety or return of the seaplanes. The men in the sea-planes, on the other hand, are not exposed to risks any greater than those of their brothers in the battle

fleet who are proceeding into a fierce gunnery engagement. Indeed, their personal safety exceeds all others engaged. When their fuel is expended they can alight on the sea and await salvage by their friends, if victorious, or by their late enemies, who at sea always become friends after the battle.

There is, however, an argument for seaplanes which far transcends the consideration of a reasonable chance of safety for the crews. Seaplanes will be able to carry on with their duties up to the moment when their fuel supply is exhausted. By eliminating all need for that return flight to the carrier, and the retention in reserve of a large portion of the fuel supply for emergencies, as must ever be necessary in land machines over water, the endurance of the machines *at the scene of operations* is very greatly increased. Let us take a simple example to illustrate this point.

Let us assume a scouting machine to have three hours' endurance in the air at 80 knots. She can thus fly, *in a dead calm*, 240 miles. In the case of a land machine operated from a carrier let us allow fuel for 40 miles as the reserve the pilot must maintain for emergency. His operative endurance is thus reduced to 200 miles. Let us now assume that his objective, the enemy fleet, is 80 miles out from the carrier. He must thus spend 160 miles on passage to and fro—wasted mileage—and 40 miles only of flight remains at the scene of operations. Such an aeroplane has half an hour of useful work out of an endurance of three hours.

Now take the seaplane with no return flight and no need, therefore, for any reserve of fuel in hand. Such an aircraft can accomplish two hours of useful flight at the scene of operations, that is to say, it has four times the useful endurance of the land machine flown from a carrier. Not only is the chance of survival for the crew immeasurably increased, but, what is of even greater importance, the pilot and observer will be able to give their full attention to the work in hand, freed as they will be from the lurking anxiety of failing to regain the carrier, which in any case is likely to be sunk.

Is there not, therefore, a strong case in favour of making provision in our future battleships and cruisers for stout seaplanes carried at specially designed davits or stump derricks, and capable of being slipped in the old-fashioned way just as sea-boats can be slipped at a speed of ten knots? Taking a fleet of twenty battleships, twenty armoured cruisers and fifty second-class cruisers, it should be perfectly feasible to hoist 260 machines of the three types specified. Such a fleet of aircraft would exceed the numbers that can now be operated from a fleet of eight carriers.

Furthermore, such a fleet of aeroplanes could be used in whole, or in part, at a moment's notice and at a position which would *harmonise* with the ideal tactical handling of the fleet in the impending action, regardless of the direction of the wind. Any particular types, moreover, can be used separately or simultaneously, an important point. If circum-

stances of weather, or any other circumstances, rendered the employment of aircraft undesirable or impossible, the fighting strength of the fleet would not have been impaired by the sacrifice of a ship or a gun.

We have, in fact, achieved the maximum output of air strength and fleet strength without cost beyond the relatively trifling expenditure on the machines themselves. The crews of the seaplanes would, it need hardly be said, be *seamen*, to whom such work would be child's play. *Flying, whatever aeronauts may say, is not in itself a whole-time profession for men.* In peace-time, it may frankly be admitted, seaplanes available for picnics, shooting parties, or as substitutes for captains' galleys when lying at anchor far from shore, would be fun.

In conclusion, it may be said that there is no technical difficulty, so far as can be discovered, to specially designed davits, or stump derricks, at which the seaplanes can be secured and from which they can be lowered into the water when stopped, or slipped by dropping gear when the ship is under way at reduced speed.

If there are in reality over-ruling technical objections to carrying seaplanes in this manner in battleships and cruisers the author has no constructive proposals to offer, and he would advocate the total abolition of aeroplanes from the future British Navy as being, by any other means of employment, of insufficient importance to justify the present disproportionate effort that their utilisation involves.

CHAPTER XV

A REDUCED NAVAL STAFF

IN a preceding chapter the existing Naval Staff, its size as well as certain of its functions, was exposed to criticism, but the author was careful to guard himself against a charge of prejudice, or extremism, by admitting frankly that a Naval Staff of small dimensions is clearly necessary. Without, therefore, reverting to a critical attitude, and allowing previous criticisms to serve as the reasoned argument in support of constructive proposals, it is possible to set down shortly and without more ado what is considered to be the least staff that will adequately serve such a fleet as has been delineated as the ideal of a modern navy.

The term "least staff" is used advisedly because it is the whole essence of the argument throughout this book that, whether in material, strategy or personnel, we should aim at the very minimum provision and effort that will adequately fulfil the requirements of dominant sea-power.

The term "Staff" is now applied in two distinct senses. In capital letters it applies generally to that body of officers attached to Flag-officers ashore and afloat for purposes of advice and for "devilling."

But there is another branch of staff officers which mans the Shore Establishments for the purpose of

instructing junior officers and ratings in their specialist duties, and yet another large body "on the staff" of these same establishments for purposes of design, experiment and research, and for allied activities.

Dealing first with the Naval Staff in the first sense, it is clear that a small number of officers is essential to advise the Board of Admiralty on technical matters of material and weapons, so that in the event, for example, of new construction being planned by the Board, in conjunction with their professional engineering and constructive advisers, vital material questions will be duly weighed and reported upon by competent executive officers. Thus the Controller's existing departments—Ordnance, Torpedoes, Equipment—are essential. The Department of Scientific Research should, however, be abolished. Into these three existing departments can be introduced three advisers on aerial, submarine and wireless material without the existence, as at present, of special staff departments for these auxiliaries.

The Personnel Departments, civil as well as naval, which come directly under the Second Sea Lord are clearly essential, and in no need of change beyond mere pruning.

The remainder of the Naval Staff, looked upon rather humorously as the great "Thinking Box" of the Navy, is, in the view of many naval officers, not only unnecessary, but a positive source of confusion and danger, being indeed the seed-bed from which

all our post-war white elephants and unsound policies have sprung. It should therefore be disbanded, bag and baggage, leaving the Board of Admiralty free once again to consider all great questions of policy in the quiet of the Board Room without that unceasing rumble of the wheels of the staff juggernaut in its ears, and with its attention undistracted by those mountains of paper which it is the express business of the juggernaut to manufacture.

It seems to be forgotten today that in the report of a Commission, appointed many years ago and charged with the duty of examining the system of administration of the Navy and Army, the considered view was expressed that the system of control by the old-fashioned Board of Admiralty, unassisted then by a great staff, came as near to perfection as any system of administration that could be devised, forming, indeed, a pattern for all other offices of State.

Turning to the flagships at sea, it is again clear that Admirals require, as in earlier days, a small personal staff to ease them of the burden of personal attention to the details and handling of the ships in which they fly their flags. They also manifestly need an experienced secretary and small secretarial staff to deal with administrative correspondence which, even after the disappearance of the present inflated executive staffs which produce the bulk of the present paper-work, will always be considerable.

They will always require a highly competent flag

lieutenant to translate their executive orders into signals, and for social duties.

Beyond the traditional staff of flag captain, flag lieutenant and secretary, a Captain of the Fleet is a very real need, but beyond these four no other staff officers seem in any way necessary for relieving Admirals of their own essential duties and grave responsibilities. On technical questions of gunnery and engineering the officers born for these duties in the flagship, and very properly selected for their exceptional abilities, are always at the Admiral's elbow should he require information or advice. Thus at sea we return quite simply to the staffs deemed adequate for the support of Admirals before this staff and committee craze settled down like a blight upon our modernist Army, Navy, and Church, and upon the transport and staple industries of the country.

Turning again from the Naval Staff to the staffs of the Shore Establishments, an adequate instructional staff is obviously necessary, and today, as in the past, the existing staffs are a byword of excellence and efficiency and in no need of any pruning knife. Outside the instructional staffs, however, there has grown up a great body of experimental and technical staff officers whose duties definitely encroach upon the duties proper to the engineering profession in its various branches. Surely if an executive officer shows a particular aptitude, or craving, for such work he has mistaken his profession as a sailor and should be seconded

into a technical department and in the future make his career as an engineer or an ordnance officer. The skilful use of weapons and material at sea in no way necessitates preoccupation with questions of design and experiment, except in so far as a knowledge of material details is connected with the skilled operation of weapons, that knowledge, in fact, which is imparted by the instructional staffs of the shore establishments. It is therefore advocated that these activities should cease to engage the attention of sailors. If such appointments lapse, the work of experiment and design in the naval establishments can be relegated once again to the .Royal dockyards and private arsenals, from which this branch of naval activity should never have been divorced and the great bulk of which is, as a matter of fact, totally unnecessary.

In conclusion, it is advocated that no officers below the rank of Captain should be intimately associated with the plans, the policies and the duties of Flag officers. Junior officers have still to equip themselves, and prove themselves, as practical executive seamen of high capacity. The rank of Captain sets the seal, or should set the seal, on the final attainment of that first-class proficiency in seafaring and command essential in Flag officers, and at this stage, but not before, they should be admitted in rare cases to the inner minds of Admirals afloat and at the Admiralty.

CHAPTER XVI

THE TRAINING OF OFFICERS AND MEN

ON the subject of the future training of officers and men it will be obvious to any readers who may have had the patience to follow the argument of this book up to the present point that the author belongs to that large body of naval opinion which regards the sea, and the sea alone, as the great university in which sailors for all time should graduate. Practice and experience, rather than precept, are the watchwords of the Blue Water School. This is not, of course, to say that adequate instruction in drill, and in the necessary details of material, is not essential in the Shore Establishments, and it has been emphasised that the present instruction is beyond criticism in quality, though perhaps a little excessive in quantity.

We surely need to cut the cables that now bind us all too closely to the shore. When this is accomplished the adequate training of officers and men for the most part settles itself. In this connection it is perhaps permissible to emphasise that the New Navy that has been depicted will enable the bulk of officers and men to serve the whole of their careers at sea. The great reduction in individual tonnage of ships, and the elimination or reduction of the organisation at the back of auxiliary and

subsidiary arms such as torpedoes, aircraft, submarines, gas, mines and so forth, will add immensely to the numbers of ships at sea and thus to the absorption of sea-going personnel, and to the existence of appropriate sea-going appointments for officers of flag-rank and captain. Shore jobs will become the exception rather than, as now, the rule.

A return to the use of Welsh coal as the fuel of the Navy will reinstate the splendid evolution of coaling ship as one of the principal means of training seamen, and of selecting them for leading and petty officer rates. Executive talents will thus once again become the preponderating characteristic of officers and petty officers, material talent receding to the secondary, but still vitally important, position of a servant in the hands of skilled and liberally minded seamen. Executive officers need to return to Mount Olympus in fact as well as in name.

There is no need to dwell further on these matters. There is, however, an important proposal that the author would like to make, a proposal which may sound to laymen like a hankering after the Ark of our far-distant forebear. The proposal is, in brief, the reintroduction of full-rigged sailing ships in which midshipmen and boys would undergo the first two years of their apprenticeship to the sea. Such a training is frankly and freely admitted by progressively minded naval officers, and by the majority of experienced captains in the Royal Merchant Marine, to be invaluable as an introduction to our noble calling of the sea, and in no single particular disad-

vantageous to the duties proper to seamen whose lives, for the remainder of their careers, will be cast in the most modern and up-to-date steam or motor ships, mercantile or naval.

It has already been pointed out that England is among the few sea-faring nations that have totally abandoned this preliminary training of sailors for the Navy, and without such a training it is difficult to see how we can retain our historic pre-eminence as the master-mariners of the world.

The author, speaking solely for himself, has throughout his career felt the lack of this initial grounding in the seaman's calling, notwithstanding that he has served for many years in submarines which, by very general consent, provide the nearest approach in a modern Navy to training in sail, strange as such a statement must sound to a layman.

Though a great body, if not a definite majority, of naval officers admit the immense value of an early training in sail, it is always turned off with a laugh as being something quite impossible in 1930. But why is it impossible? It is true that it would be difficult to man the ship for her maiden voyages, but all who have a great regard for the enterprise and self-reliance of naval officers know perfectly well that a ship's company of modern officers and men shipped off in a sailing ship would struggle through their wind-jammer birth-pangs with credit to everyone concerned. Such heroic methods would not, however, be necessary if the Merchant Marine, through the Royal Naval Reserve of officers and

men, would consent to help us all out for the first few voyages.

Here at least is a definite and practical constructive proposal and one which it is believed with some confidence will receive the sympathetic support of the Navy as a whole, and particularly of the younger generation.

There remains one matter to be mentioned. The Entry of Cadets is admittedly on a not entirely satisfactory basis. We have the two competing systems running in double harness—early entry at the age of thirteen and a quarter to Dartmouth, and public school entry at the age of eighteen.

The author has for many years been advocating, in season and out of season, the latter system as the preferable of the two on grounds of economy, liberality of outlook, and as a safeguard against a mistaken choice of profession at an unduly immature age.

Lately, it must be admitted, he has been much influenced by the view of many officers that one system combining the outstanding advantages of both is the ideal. An early age of entry may perhaps, on balance, be desirable if it is relieved of certain weaknesses which the present Dartmouth system seems to involve. Thus, first and foremost, the winning of a naval cadetship should be restored to the rank of a prize, which now it is not. Surely the entrance examination should be keenly competitive, and of a nature, through the medium of optional subjects, which would permit the inclusion

in the Navy of a strong representation of the essentially classical turn of mind as well as of that type of ability which reveals itself through mathematics and the modern side of the schools. "The Interview," if it is retained at all, should take place *after* the examination in order to eliminate boys who are clearly unsuited to the career of a naval officer. Such exclusions would, it is believed, be few. With such a system of entry it would be necessary to introduce further classical instruction into the college at Dartmouth, as at other public schools, in order that boys who had gained entry with distinction in classical subjects might continue their education on those lines clearly suited to their bent of mind.

With a strong leaven in the New Navy of classical thought, using that term in its most liberal sense, we shall avoid in the future the risks inseparable from the premature imposition of technicalities upon undeveloped and therefore unreflecting minds, and by this means achieve a gradual weaning of the executive branch of the Navy from its present passion for extreme specialisation carried from boyhood into middle age.

Indeed, on this question of specialism, the demon of specialism, it may be urged that specialisation should cease at the age of thirty, and that Lieutenant-Commanders should be selected for promotion to the important rank of Commander as executive general service officers and not as specialists. The specialist should always be the servant, the honoured

servant, of the general practitioner in all professions.

In conclusion, it is interesting to speculate on the outcome of the late war at sea, and on the characteristics of our existing Navy today, had the ablest and keenest young executive officers of a generation ago specialised in "general service," leaving mechanical specialism, where necessary at all, to their less brilliantly endowed brother officers and to the great engineering profession. Of this, at least, we may be sure: the late war would have been a very different story, and the Navy of today a very different and incomparably cheaper Navy. It is doubtful, indeed, if a naval crisis would ever have arisen, or England have surrendered her maritime supremacy. The bulk of the senior officers would now be serving in appropriate appointments at sea instead of languishing pitifully in classrooms, in Shore Establishments and at the Admiralty.

CHAPTER XVII

CONCLUSION

IN writing this book on what is believed, rightly or wrongly, to be the naval crisis from within, the author has, for the most part, addressed himself as a professional sailor to other sailors. In concluding his book he will offer no apology for addressing himself shortly to those non-seafaring members of the public who love and trust the Navy and who are therefore anxiously concerned with the naval crisis from without.

During the past few years a wave of what is rather vaguely called "pacifism" has been gathering momentum, a wave that is now submerging Western civilisation like a flood. War books and plays depicting over-morbidly and out of all perspective the foul horrors of the late trench-warfare have made a deep, though not necessarily permanent, impression on the public mind, especially on the minds of women. That wild barbaric slaughter of the best manhood of all nations, hurled in frontal attack against wire entanglements, mined trenches, machine-guns, howitzers and 4·7-inch guns spaced sometimes only a few feet apart, has produced a feeling of questioning indignation and disgust in the minds of those who can appreciate what warfare of such a nature implies, and of necessity involves.

So great is the revulsion, even among men who are indeed men and not mere exploiters of the obscene, against what was blind massacre rather than war, that it is not surprising if a certain confusion of thought is manifesting itself even in those who, on calm reflection, would never maintain for a moment that peace at any price is a creed that can be defended by a nation that is Christian in something other than name. All of us who seriously profess Christianity, no matter how frail and faltering our practice, must of necessity set our faces rigidly against any war that is based upon, or even seriously mixed with, unworthy motives. Officers and men in the Navy and Army hold this conviction at least as strongly as their civilian countrymen, for Christianity in its militant and therefore truest sense has always been a noteworthy characteristic of the two great fighting services. It is true that sailors and soldiers will, for the most part, wage any war that their master, the civil power, may launch, but they rely, as they must, upon the country as a whole to undertake no war that their conscience does not sanction.

Now few will maintain that the present widespread agitation to "outlaw war" is based upon any sudden excess of moral rectitude in the nations of the Western world. Indeed, it is a matter of very general consent and uneasiness that the evil passions of which war is the natural child are unusually and dangerously in evidence, and not even decently concealed, especially among the more noisy, belli-

cose and atheistical "pacifists." Are we not, in fact, attempting to outlaw the penalties of men's follies and vices instead of striving as Christian men to extirpate those passions that must compel, eventually, the penalties? Are we not very literally attempting to gather figs from thistles?

Again, it is now very widely argued that no cause can justify war, and that no crime against abstract right—*justitia*, to use the noble Roman term—can deserve so ghastly a nemesis as the late war inflicted upon guilty and innocent alike, though no grown man or woman is entirely innocent of the causes that engender the scourge of war.

Can this truly be the argument of a great country? Surely defence of the weak, and the championship of what we, as a nation, believe to be the right, regardless of any consequences no matter how terrible or alarming, is a frame of mind that must inspire our country if it is to continue and extend what we believe to be its noble mission in an unruly and imperfect world.

It is true that we, like our foreign friends, have not always fought for worthy causes, and the author, for his part, does not subscribe to the doctrine of "My country, right or wrong." Such a doctrine is in no way in harmony with the truest loyalty. Should not we redouble all our efforts to convert ourselves, as well as our fellow-countrymen and the world, to that old-fashioned militant Christianity of which physical warfare (only the embodiment of

spiritual warfare) *as a last resource and in extreme cases* is a necessary ingredient?

Great European wars such as the Napoleonic wars and the late war involve battle between two incompatible principles—freedom and serfdom, light and darkness. Yet it is against such wars that the League of Nations, through the mouth of one of its leading spokesmen, was invoked as a barrier. Can cynicism and immorality be more highly exalted?

If we are honest with ourselves and with one another are we not compelled to confess that it is Fear and not the love of truth, equity and justice that inspires the bulk of the present pacifism and the clamour to undertake in advance, regardless of the matter that may be at issue, to renounce war? Do we not also know in our hearts that when some great issue of what we conceive to be right or wrong arises, a willingness, nay more a passion, to sacrifice our peace and happiness, and life itself, will always triumph over the base feelings of fear, financial advantage, and comfortable expediency?

A pact in advance to outlaw war seems therefore to be as impracticable as it is unquestionably craven and immoral. The fear which is now the mainspring of policy is due partly to the memory, and partly to the existing misery, that are the legacies of the barbaric and unreasoning massacre of the late war, and partly, and perhaps more extensively, to the honest belief that the last war must be a criterion of any possible future war through incomparably less terrible and bloody owing to the super-

stitious belief in the power of what is falsely called Modern Science as exhibited in ordinary *engineering* products such as aircraft, tanks, submarines and so forth. " The next war " must, it is argued, extinguish Western civilisation as the late war very nearly did.

Is this true ? If it is we are in a dilemma indeed, for we must perish quickly if we defend the right, and slowly but inevitably if we compound with evil. We have become, if the premise is correct, a nation with fatalism as its only possible creed. We are assenting to the doctrine that matter has triumphed over mind, that good must succumb to evil if sufficiently strong, and that we of this distraught twentieth century have become the slaves and not the masters of our fate.

The belief in the Power of the Air has been proved by Neon in " The Great Delusion " to be without foundation in fact. The Terror of the Air, as well as the belief in its vast commercial future, is the obscene child of a propaganda by interested persons, and by oil and aircraft Interests, that can hardly have had a counterpart in the history of this feverish world. The author would humbly pray all disinterested leaders of public opinion to master this aerial myth, and having mastered its details to expose it as a nightmare and nothing more. Thus will they lift a great cloud from the face of the world, earn the gratitude of countless men and women of all races, and exorcise a panic which darkens counsel and which must eventually lead

to that very war we are all so busy in verbally outlawing.

With the aerial and gas myths finally dispelled there still remains the theory, now strangely enough treated as a military axiom which no one disputes, that any future war must again involve the world at large, and England in particular, in another bloody and wholesale slaughter. Again why? Surely we can still be masters of our strategy and thus of our commitments and fate in war. Was our unorthodox and revolutionary strategy in the late war in reality a blessing to our brave and faithful Allies? Were our Balaclava tactics inevitable? Was the welter of massed material in all cases an aid to victory? The author considers, for his part, that by our inherently unsound continental strategy, and by our departure from our traditional island strategy, we inflicted on the world, on ourselves, on our friends and on our political enemies alike, the greatest calamity that the world has ever had to endure, a calamity that may be repeated if we persist in such policies as the Locarno Pact.

Sea-power, as strong, chivalrous and yet relentless in war as it is gentle, hospitable and friendly in peace, remains the key to England's security, to her authority in the counsels of the nations, and to the beneficence of her mission in this distraught and weary modernist world. Sea-power, supporting strictly limited military expeditions, seems to be an instrument placed in the hands of England by Providence for the settlement, in extreme and ele-

mental circumstances, of the disputes of a tragically imperfect world. The *ultimate* triumph or defeat of a great cause can in the modern world be settled more swiftly and decisively in a great sea-fight and some minor engagements than in the days of sail, through the operation of that sound sea doctrine which is common to steam and sail. Those engaged in the fight are champions for their respective countries: they face one another in their ships with no bitter or revengeful feelings; the relatively few deaths involved are a sacrifice that can be as proudly accepted by the nations involved as they are gladly offered by those whose privilege and honour it is to serve their countrymen at sea.

Casualties at sea may be reduced still further by the rebirth of the wise and chivalrous practice of our great forefathers who counted it no disgrace for ships of war to haul down their colours when the odds had become overwhelming, and the only alternative was the total destruction of the ship and the drowning of the crew by the victors in the fight. This practice, for some obscure reason, fell largely into disuse in the late war, thus frequently involving the unnecessary sacrifice of brave and loyal men, German as well as English.

In conclusion, the author would repeat his earnest hope that his criticisms of the war and of post-war naval policy will be regarded, irrespective of the merits of the case he has put forward, as a labour of love. In spite of many errors of judgment it remains true that it was the Navy that saved

England and the world in those terrible years, and it was the Navy that alone made possible the noble and bewildering self-sacrifice and devotion of the cruelly maligned dead who won the military victory ashore. Oh that we now had with us but one ten thousand of the **Men** in England who sleep in France today. It has seemed to the author and to very many others, however, that the national trust in its Navy as its sure shield cannot be fully restored until naval officers have confessed publicly their errors. We all of us, and not least the author, are wise, if we are wise, after the event. Our errors were perhaps inevitable owing to the complete novelty of sea warfare with modern fleets and weapons. The nation will assuredly judge with affectionate tenderness its sailors and its fleet, for England's Navy is, when all is said and done, a very perfect mirror of the country which it so loyally and devotedly serves.

ADDENDUM

THE LIMITATION OF ARMAMENTS

AT a time when the world is rightly concerned for the limitation and reduction of naval armaments and the avoidances of fierce competitive building, a few remarks on this somewhat whipped topic may not be out of place as an adjunct to a book which has as its subject the doctrine of sea-power, and its embodiment in the modern world.

It is characteristic of the topsy-turvy times we live in that the essentially defensive armaments with which England is chiefly concerned should be singled out for especial reprobation by pacifists, while the bomb, employed indiscriminately against non-combatants, is championed: but so it is. It is at least arguable that unceasing discussion of this question is producing just that feeling of irritation and suspicion which it is intended to allay, and that there is a very real risk that any future treaty of limitation or reduction may stereotype, or conjure into existence, navies that are greater and more costly than those that would have been maintained in the coming generation if nations had provided themselves with those fleets which they individually judged to be adequate for their various, divergent and reasonable needs.

The author, for his part, can conceive no adequate reason why great maritime nations such as England, France, Italy and Japan, should not build what vessels they consider they require. Surely the civil power in each country can be trusted to check, if only on grounds of expense, any provision manifestly in excess of reasonable requirements? If a particular country cannot be so trusted, it is difficult to see how its intentions are to be curbed by conference. In the absence of some deliberate megalomaniacal project, such as inspired Napoleon or our late enemies, no country, as a matter of experience, does in fact maintain a navy out of reasonable proportion to her strictly defensive needs. Any country that steadily and systematically develops and maintains a fleet demonstrably in excess of even the most liberal interpretations of her defensive requirements is at once suspect, quite naturally, of dictatorial if not definitely bellicose intention, and competition in naval armaments then becomes inevitable and indeed necessary.

By artificially fixing standards of defence a perfectly peacefully disposed nation is put on its national mettle, so to speak, and it is as certain as anything can be in an uncertain world that the final standard agreed upon, largely for the sake of agreement and the cessation of haggling, will be much in excess of the standard that would gradually have adjusted itself amiably on natural and economic grounds.

Though the author is of the opinion that a truce to further talk or conference on naval armaments

would speedily usher in a long period of quietude and good feeling as a substitute for the present exacerbation of feeling in which the word " peace " remains a word rather than a reality, he fully appreciates that England and America are now committed to such an extent as to render some further talk almost inevitable. Assuming therefore that a further agreement on limitation on an arbitrary and mechanical basis is a foregone conclusion, what is the simplest and therefore the best system to employ? What choice of systems, in the first place, is open to the contracting nations?

The various alternatives are as follows:

1. Limitation of the total tonnage of each class of ship, with freedom of action as to individual tonnage and armament in each class.

2. Limitation of the total tonnage of each class, with a further limitation on the tonnage and armament of the individual ships of each class.

3. Either (1) or (2), with the addition of a prohibition of the future construction of certain classes of vessels, notably submarines.

4. Limitation by classes as in (1), (2) or (3), with the right of increasing one class at the expense of another, according to individual taste.

5. Limitation of the total tonnage of the Navy as a whole and with no regard to classes, but with restrictions on individual tonnages and armament and with or without a prohibition on the construction of certain classes of vessels, again notably submarines.

6. Limitation of the total tonnage of navies as a whole, with complete freedom of action in every particular within the agreed total tonnage.

Let us now examine very briefly each of these six possible systems.

(1) The objection to this system is that it seems inevitably to crystallise in existence certain classes of vessels which, under natural circumstances, might well disappear on grounds of inefficacy or superfluity from the fleets of all nations. Thus, for example, an agreed tonnage of aircraft carriers or submarines is tantamount to assuming that this tonnage will be ordered, much as we order a pound of sugar, irrespective of its relative value in a properly balanced fleet.

(2) The same criticism holds good as for (1), with the added disadvantage that initiative, professional knowledge and individuality are at once shackled, and the human mind, expressed through design, is forcibly turned Robot. If naval officers of all nations are prevented from constructing what they believe to be the best ships for their purposes, the Admiralties of the world will be filled with secret drawings and plans for the rapid construction of something superior to the maximum allowed by treaty. Suspicion will thus thrive as in a hot-house. Furthermore, it will be possible for any nation to render existing fleets obsolete by transgressing the treaty, just as Lord Fisher scrapped the navies of the world, including our own, by the sudden launching of the Dreadnought policy.

(3) The same criticisms hold good as for (1) and (2), with the further objection that one or two powerful nations are forcing upon another nation a maritime policy with which it dissents. Such action is little short of a belligerent act, though cloaked in the verbiage and with the trappings of peace. The dissenting nation is put in a false position because it is saddled with the stigma of intentions which in no way inspire its insistence upon the retention of a particular class of vessel in which, perhaps wrongly, it places reliance.

If such a nation, for the sake of peace and quiet, abandons its attitude, we may be quite sure that it will keep its ideas in pickle so to speak, and, in the author's view, quite rightly.

(4) This system is a variant on the former three, and while to some extent mitigating the injustice of forcing one nation to forego the use of a class of vessel in which, rightly or wrongly, it believes, it is tarred with the brush of haggling, and keeps alive suspicion of the motives of any nation that increases one class at the expense of another.

(5) This system has the advantage of simplicity, and disarms the criticisms levelled against the preceding four. It again puts naval thought and initiative into chains, however, and in an arbitrary manner, compelling professional men to design and employ ships and weapons inferior to those they could design as free agents, unless of course the limit placed upon tonnage and calibre is sufficiently high to enable the ideal weapon to be mounted. Surely,

however, it is unnecessarily quixotic to force other nations to be wise, and wrong to compel any man to do less than his best with his mind ? Here, again, if individual tonnages and weapons are arbitrarily limited below the ideal by treaty we may be quite sure that plans will be kept in the various Admiralties for the rapid production of superior vessels in case of emergency, or the advent on the scene of a new Kaiser or Lord Fisher in any country.

(6) It need hardly be said that the limitation of the total tonnage of every vessel that flies the national ensign is the system of limitation favoured by the author. Indeed, such a system is in harmony with the entire argument of this book and does not invalidate it in any single particular.

Apart from a general dissent from the whole principle of compelling any country to adjust its naval requirements to an arbitrarily fixed standard, which may well prove to be higher than would have been the case in the absence of a treaty, the advantages of a treaty, if we must have one, based on total tonnage limitation with perfect freedom within the limit, seem to be unmixed with any single disadvantage.

First and foremost we have absolute simplicity, and not only simplicity but elasticity without haggling, because the total tonnage can at any time be reduced or increased by mutual agreement without involving any suspicion or bargaining over details. An agreed reduction all round, or at some future date an increase, will leave *relative* strengths un-

affected. Though the relative standards are fixed by treaty, any country will be at liberty to reduce her fleet below the standard agreed without affecting the treaty, and we need not doubt that gradually fleets will be so reduced by those countries that manifestly do not require so great a fleet as, on grounds largely of *amour propre* or wealth, they are by treaty allotted. That England requires a European Two-Power standard is not seriously disputed.

Great as are the foregoing advantages, there are yet more important ones. Seamen of all nations retain what is essential in any great profession—intellectual freedom. Thus if any particular nation is enthusiastic over the value of aircraft carriers they are at liberty to construct them in any size or numbers they think fit. So with submarines or any other class of vessel. Whatever they elect to construct must, however, be at the cost of other tonnage. Because all ships that fly the national ensign are to be included in the total tonnage allowed by treaty, the submarine depot ships, those serious additions to any submarine provision, can of course be provided only by the sacrifice of fighting ships. Battleships of 40,000 tons would be permissible to any country sufficiently unwise to build them. Indeed, such a system of limitation provides a sieve through which naval thought can be winnowed, and is perhaps the surest means by which naval officers of all nations can be compelled to clear their minds on what in reality constitutes sea-power and fighting efficiency. We shall cease to halt between the several

conflicting opinions of specialist enthusiasts and the all-round seaman will once again come into his own, with a vast saving to taxpayers and a great increase in fighting power.

By this method of limitation we perfectly harmonise the relative and absolute aspects of sea-power. Each navy can construct its fleet on what it conceives to be an ideal basis for its special requirements—that is to say, on an *absolute* basis. When so constructed within the prescribed limits the fleets are relatively balanced, at least in the opinion of their respective nations, and while retaining their absolute nature can be increased or decreased without upsetting the *supposed* relativity of their strength.

A treaty of limitation on these lines might, on balance, be a definite advantage on technical grounds if the total tonnages allotted to each nation were considerably below those now in existence, and for this reason. It is a matter of common remark, at least in the English Navy, that we have in commission many white elephants. If the 1,400,000 tons (odd) of naval tonnage were reduced, many ships of questionable value could quietly and unostentatiously disappear without raising discussions and controversies which are better avoided.

In conclusion, it may be well to repudiate the materialistic doctrines of those, ashore or afloat, who lay undue stress on the relative worth of navies by counting guns and weighing up the tons. Courage, professional skill, sound strategical thought and

brilliant leadership can still, with less material, rout the materially stronger opponent, provided always that the disparity in material is not fantastic or overwhelming. It is this fact which, in the last analysis, alone justifies a nation in retaining a fleet materially less powerful than that of a neighbour. The British Navy will surely be wise to remember this, and to keep in constant mind that great seafaring population and those matchless shipbuilding resources that must always be retained at our back in case of emergency. With these facts in view we can, for the time being, envisage what we may consider the exorbitant claims of another nation without undue alarm or pother.

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